
REQUEST FOR PROPOSAL (FOR DESIGN/BUILD CONTRACT)

SOLCITATION NO. DACA45 02 R 0001

**PHYSICAL FITNESS CENTER
CRWU 02-3001**

BUCKLEY AFB, COLORADO



DECEMBER 2001



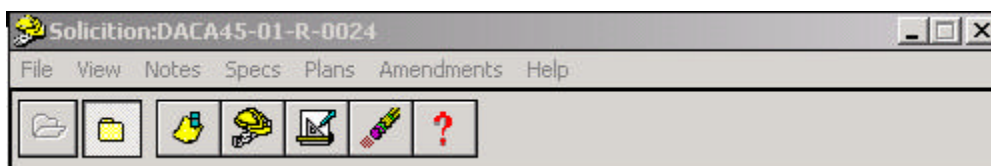
US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

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HELPFUL HINTS

A. CD-ROM CONTRACT VIEWER

Contract Viewer will appear after CD-ROM is inserted in CD Drive. Example Contract Viewer is shown below.



Notes (Clipboard)

Contract Summary (Description of Project)
Plan Holder's List (List of registered Contractors, Subcontractors, Suppliers, Printers & Plan Rooms Registered at time solicitation was issued)
Printers (List of additional printers who will print RFP plans and Specifications via Web Address)
Safety Manual (EM 385-1-1)
Equipment Schedule (Construction Equipment Ownership and Operating Expense Schedule)

Specs (Helmet)

Advertised Contract Requirements and RFP Specifications. Attachments, Appendices and/or Items as noted may be included as separate documents.

Plans (Square with Triangle)

Advertised RFP Plans.

Amendments (Pencil)

There are typically no items included under this feature unless CD-ROM is reissued by amendment. Under reissued CD-ROM's, both amendment narratives and reissued drawings may be accessed here.

Help (Question Mark)

Includes basic information regarding software navigation (Adobe Acrobat 5.0 and Sourceview).

B. OTHER INFORMATION ON CD-ROM

Other Items on CD-ROM may be accessed via your Windows Browser. Items included are:

Specsintact Software to be used for editing project specifications (after contract award). See folder labeled "Software".

Unified Facilities Guide Specifications (UFGS) to be used for preparing projectspecifcatons. See folder labeled "Guides".

Omaha Guide Specifications provides unedited Corps of Engineers Guide Specifications – Omaha District and other edited Specifications to be used for preparing project specifications. See folder labeled "Omaha".

Survey Drawing files in either Microstation (.dgn) or AutoCad (.dwg) format. See directory labeled "Survey". Software for viewing these files is the responsibility of the Offeror.

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REQUEST FOR PROPOSAL DOCUMENTS FOR
CONSTRUCTION OF

**PHYSICAL FITNESS CENTER
CRWU 02-3001**

BUCKLEY AFB, COLORADO

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SOLICITATION, OFFER, AND AWARD (Construction, Alteration, or Repair)	1. SOLICITATION NO.	2. TYPE OF SOLICITATION	3. DATE ISSUED	PAGE OF PAGES
	DACA45 02-R-0001	<input type="checkbox"/> SEALED BID (IFB) <input checked="" type="checkbox"/> NEGOTIATED (RFP)	07 DEC 2001	1 OF 6

IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.

4. CONTRACT NO.		5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO.
7. ISSUED BY	CODE	8. ADDRESS OFFER TO	
	CT		
U S ARMY ENGINEER DISTRICT, OMAHA 106 South 15th Street Omaha, Nebraska 68102-1618		U.S.ARMY CORPS OF ENGINEERS, OMAHA Attn: CONTRACTING DIVISION (CENWO-CT) 106 South 15th Street Omaha, Nebraska 68102-1618	
9. FOR INFORMATION CALL:	A. NAME	B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS)	
	See SECTION 00100, Para. 15	See SECTION 00100, Para. 15	

SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS (Title, identifying no., date):

The Offeror hereby agrees to do all the work described in these documents entitled:

PHYSICAL FITNESS CENTER
CRWU 02-3001
BUCKLEY AFB, COLORADO

RETURN WITH PROPOSAL: SECTIONS 00010 (SF1442) AND PRICE PROPOSAL BACKUP INFORMATION (BY CSI DIVISION), SECTION 00600, AND PROPOSAL INFORMATION IDENTIFIED IN SECTION 00110

OTHER BONDING INFORMATION: SEE CONTRACT CLAUSES CLAUSE "PERFORMANCE AND PAYMENT BONDS".

* - SEE SECTION 00110 FOR NUMBER OF COPIES

11. The Contractor shall begin performance within <u>10</u> calendar days and complete it within <u>**</u> calendar days after receiving	
<input type="checkbox"/> award, <input checked="" type="checkbox"/> notice to proceed. This performance period is <input checked="" type="checkbox"/> mandatory, <input type="checkbox"/> negotiable. (See <u>**SEE SECTION 00800</u> .)	
12A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? (If "YES," indicate within how many calendar days after award in Item 12B.)	12B. CALENDAR DAYS
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and * copies to perform the work required are due at the place specified in Item 8 by 1400 (hour) local time 23 JAN 2002 (date). If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee ☐ is, ☒ is not required.

C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.

D. Offers providing less than 90 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

14. NAME AND ADDRESS OF OFFEROR (Include ZIP Code) <div style="color: blue; font-weight: bold;">DUNS Number:</div>				15. TELEPHONE NO. (Include area code) 16. REMITTANCE ADDRESS (Include only if different than Item 14)			
CODE FACILITY CODE							
17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within <u>90</u> calendar days after the date offers are due. (Insert any number equal to or greater than the minimum requirement stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.) <div style="display: flex; align-items: center;"> <div style="width: 150px; text-align: right; font-weight: bold; color: black;">AMOUNTS</div> <div style="width: 10px; text-align: center;">➡</div> <div style="flex-grow: 1;"> <div style="color: blue; font-weight: bold;">See Attached PRICING SCHEDULE</div> <div style="display: flex; justify-content: space-between;"> Contractor's Fax No. _____ CAGE CODE _____ </div> <div>Contractor's E-Mail address _____</div> </div> </div>							
18. The offeror agrees to furnish any required performance and payment bonds.							
19. ACKNOWLEDGMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to the solicitation - give number and date of each)							
AMENDMENT NO.							
DATE							
20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)				20B. SIGNATURE		20C. OFFER DATE	
AWARD (To be completed by Government)							
21. ITEMS ACCEPTED:							
22. AMOUNT				23. ACCOUNTING AND APPROPRIATION DATA			
24. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)			ITEM <div style="color: blue; font-weight: bold;">26</div>	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> 10 U.S.C. 2304(c) () <input type="checkbox"/> 41 U.S.C. 253(c) () </div>			
26. ADMINISTERED BY CODE <div style="color: blue; font-weight: bold;">U.S. Army Engineer District, Omaha 106 South 15th Street Omaha, Nebraska 68102-1618</div>			27. PAYMENT WILL BE MADE BY <div style="color: blue; font-weight: bold;">USAED Omaha c/o USACE Finance Center 5722 Integrity Drive Millington, TN 38054-5005</div>				
CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE							
<input type="checkbox"/> 28. NEGOTIATED AGREEMENT (contractor is required to sign this document and return _____ copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all work, requisitions identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications incorporated by reference in or attached to this contract.				<input type="checkbox"/> 29. AWARD (Contractor is not required to sign this document.) Your offer on this solicitation, is hereby accepted as to the items listed. This award consummates the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.			
30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN (Type or print)				31A. NAME OF CONTRACTING OFFICER (Type or print)			
30B. SIGNATURE		30C. DATE		31B. UNITED STATES OF AMERICA BY		31C. AWARD DATE	

PRICING SCHEDULE

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>Amount</u>
------------------------	---------------------------	------------------------	--------------------	----------------------

BASIC ITEMS

1.	All Work Complete for the Physical Fitness Center, excluding Basic Item 2 and Options listed below.	Job	L.S.	\$_____
2.	Design Cost for Basic Item No. 1.	Job	L.S.	\$_____
<u>SUBTOTAL (BASIC ITEMS 1& 2)</u>				\$_____

OPTION ITEMS

O-1	All work complete to provide the additional space for the Health and Wellness Center (HAWC) Area, Service Drive and Entrance Sidewalk to HAWC Area, and Trees and Shrubs associated with the HAWC Area with irrigation located on the West Side of the New Physical Fitness Center. The HAWC Area includes an waiting area, office spaces, classroom, computer library, Ergometry stations, wellness assessment rooms, kitchen/food demonstration area, Library/Waiting room, Men' and Women's toilet, janitor closet, Storage area. See Note 4 below for Additional equipment items also included. (Construction Cost Only)	Job	L.S.	\$_____
	Additional Design Costs for Option 0-1	Job	L.S.	S_____
TOTAL FOR OPTION 0-1				\$_____

O-1A	All work complete for Mechanical Room 140 And the extension of the east-west corridor located north of HAWC Area as shown on RFP drawings AC.2 (construction cost).	Job	L.S.	\$_____
	Additional Design Costs for Option 0-1A	Job	L.S.	S_____
TOTAL FOR OPTION 0-1A				\$_____

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BUCKLEY AFB, COLORADO

O-2	All work complete to provide Weight Room 139 located on the West side of the New Physical Fitness Center. (Construction Cost Only)	Job	L.S.	\$_____
	Additional Design Costs for Option 0-2	Job	L.S.	\$_____
	TOTAL FOR OPTION 0-2			\$_____
0-2A	Additional amount to relocate Mechanical Room 140 to be west of Weight Room 139, revision of corridors and associated work as shown on Sheet AC.3 of the RFP drawings. (design and construction).	Job	L.S.	\$_____
O-3	All work complete to provide Racquetball court Room 149, extension of corridor 144 and addition of corridor between Rooms 148 and 149, which are located east of the Gymnasium of the New Physical Fitness Center. (Construction Cost Only)	Job	L.S.	\$_____
	Additional Design Costs for Option 0-3	Job	L.S.	\$_____
	TOTAL FOR OPTION 0-3			\$_____
O-4	All work complete to provide Racquetball court Room 150 and extend corridor 144, which are located east of The Gymnasium of the New Physical Fitness Center. (Construction Cost Only)	Job	L.S.	\$_____
	Additional Design Costs for Option 0-4	Job	L.S.	\$_____
	TOTAL FOR OPTION 0-4			\$_____
O-5	All work complete to provide alternate Location for Comm Room 166,. Pool Mechanical Room 167, Pool Storage Room 168, Lap Pool Area 169, two (s) Jacuzzis for pool area, And revising Room function for Room 174 located on the East Side of the New Physical Fitness Center. (Construction Cost Only)	Job	L.S.	\$_____
	Additional Design Costs for Option 0-5	Job	L.S.	\$_____
	TOTAL FOR OPTION 0-5			\$_____

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O-6	Additional cost to provide an additional 117 parking stalls for the parking lot located on the north side of the new Physical Fitness Center. This includes: new access drive from Eldora Street, striping, lighting, signage, grading and storm drainage (As shown on Sheet P3.02 and specified in Section 01002, SITE WORK). (Construction Cost Only)	Job	L.S.	\$ _____
	Additional Design Costs for Option 0-6	Job	L.S.	\$ _____
TOTAL FOR OPTION 0-6				\$ _____
O-7	Cost to provide the additional landscape plantings and irrigation as shown on Sheet P3.02 that are not shown on Sheet P3.01 and specified in Section 01002 SITE WORK. (Construction Cost Only)	Job	L.S.	\$ _____
	Additional Design Costs for Option 0-7	Job	L.S.	\$ _____
TOTAL FOR OPTION 0-7				\$ _____
<u>GRAND TOTAL AMOUNT</u> <u>(ALL BASIC ITEMS & OPTIONS)</u>				\$ _____

NOTES:

1. See Section 00100, INSTRUCTIONS, CONDITIONS AND NOTICES OFFERORS, paragraph 3 EVALUATION OF OPTIONS for evaluation of pricing items and options. The Government reserves the right to exercise Options within 90 calendar days after Notice to Proceed (NTP). Evaluation of Options will not obligate the Government to exercise the option(s). Option Item O-4 will not be exercised unless Option Item O-3 is exercised. Option Item O-1A will only be exercised if either Option O-1 and O-2 are exercised. Option Item O-2A will only be exercised if Option O-2 is exercised. Option Items O-1 will be exercised only if Item O-1A is exercised. Option Item O-2 will be exercised only if Items O-1A and O-2A are exercised.
2. Prices must be entered for all line items on the Pricing Schedule. Grand total amount price submitted without prices for individual line items will not be evaluated. Additions will be subject to verification by the Government. In case of variation between the lump-sum prices and the grand total amount, the lump-sum prices will be considered the price.
3. A modification to the Pricing Schedule, which provides for a single adjustment to the grand total amount will not be accepted. Modification to Pricing Schedule items, basic or options, should state the application of the adjustment to each respective lump-sum price affected. If the modification is not so apportioned the Pricing Schedule item will not be evaluated.
4. For Option Item O-1, the following equipment items are also included
 - 1) Reach-in Refrigerator/Freezer

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- 2) Ice Making Machine
 - 3) Kitchen Sink
 - 4) Full size Electric Range/Oven
 - 5) Under Counter Dishwasher
 - 6) Garbage Disposal
 - 7) Air Handling unit (AHU-3) for this area.
5. Completion time for basic and options items, see Section 00800 SPECIAL CONTRACT REQUIREMENTS, clause COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984).

SECTION 00100

INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS
(July 2000, Revised November 2001)

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Attachment: Required Central Contractor Registration

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- 2 SOLICITATION RESTRICTIONS.
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 - 2.2 ESTIMATED DESIGN AND CONSTRUCTION COST.
- 3 (FAR 52.217-5) EVALUATION OF OPTIONS (JUL 1990).
- 4 (FAR 52.211-2) AVAILABILITY OF SPECIFICATIONS LISTED IN THE DOD INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) AND DESCRIPTIONS LISTED IN THE ACQUISITION MANAGEMENT SYSTEMS AND DATA REQUIREMENTS CONTROL LIST, DOD 5010.12-L (DEC 1999)
- 5 (FAR 52.215-1) INSTRUCTIONS TO OFFERORS--COMPETITIVE ACQUISITION (MAY 2001)
- 6 CHANGES PRIOR TO RECEIVING OFFERS
- 7 (FAR 52.216-1) TYPE OF CONTRACT (APR 1984).
- 8 (FAR 52.204-6) DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (JUNE 1999)
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- 12 (FAR 52.236-28) PREPARATION OF PROPOSALS—CONSTRUCTION (OCT 1997)
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- 15 OFFEROR'S QUESTIONS AND COMMENTS.
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SECTION 00100

INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS

1 DEFINITION OF "DESIGN-BUILD" PROCESS

The "Design-Build Process is the procurement of a facility utilizing a Request for Proposal (RFP) to solicit for the design and construction of a facility by a single contractual entity. The contractual entity may be a "Design-Build" firm, or joint venture between an architect-engineer (A-E) and construction firm, or a construction management (CM) firm joint venture with an A-E and a construction firm.

2 SOLICITATION RESTRICTIONS.

2.1 GENERAL CONTRACTOR.

This solicitation is unrestricted (not limited to small business concerns).

2.2 ESTIMATED DESIGN AND CONSTRUCTION COST.

The estimated [design and] construction cost of this project is between \$10,000,000 and \$15,000,000.

3 (FAR 52.217-5) EVALUATION OF OPTIONS (JUL 1990).

Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. Evaluation of options will not obligate the Government to exercise the option(s).

4 (FAR 52.211-2) AVAILABILITY OF SPECIFICATIONS LISTED IN THE DOD INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) AND DESCRIPTIONS LISTED IN THE ACQUISITION MANAGEMENT SYSTEMS AND DATA REQUIREMENTS CONTROL LIST, DOD 5010.12-L (DEC 1999)

Copies of specifications, standards, and data item descriptions cited in this solicitation may be obtained—

(a) From the ASSIST database via the Internet at
<http://assist.daps.mil>; or

(b) By submitting a request to the—

Department of Defense Single Stock Point (DoDSSP)
Building 4, Section D
700 Robbins Avenue
Philadelphia, PA 19111-5094
Telephone (215) 697-2667/2179
Facsimile (215) 697-1462.

(End of provision)

5 (FAR 52.215-1) INSTRUCTIONS TO OFFERORS--COMPETITIVE ACQUISITION (MAY 2001)

(a) *Definitions.* As used in this provision--

"Discussions" are negotiations that occur after establishment of the competitive range that may, at the Contracting Officer's discretion, result in the offeror being allowed to revise its proposal.

"In writing," "writing," or "written" means any worded or numbered expression that can be read, reproduced, and later communicated, and includes electronically transmitted and stored information.

"Proposal modification" is a change made to a proposal before the solicitation's closing date and time, or made in response to an amendment, or made to correct a mistake at any time before award.

"Proposal revision" is a change to a proposal made after the solicitation closing date, at the request of or as allowed by a Contracting Officer as the result of negotiations.

"Time," if stated as a number of days, is calculated using calendar days, unless otherwise specified, and will include Saturdays, Sundays, and legal holidays. However, if the last day falls on a Saturday, Sunday, or legal holiday, then the period shall include the next working day.

(b) *Amendments to solicitations.* If this solicitation is amended, all terms and conditions that are not amended remain unchanged. Offerors shall acknowledge receipt of any amendment to this solicitation by the date and time specified in the amendment(s).

(c) *Submission, modification, revision, and withdrawal of proposals.*

(1) Unless other methods (e.g., electronic commerce or facsimile) are permitted in the solicitation, proposals and modifications to proposals shall be submitted in paper media in sealed envelopes or packages (i) addressed to the office specified in the solicitation, and (ii) showing the time and date specified for receipt, the solicitation number, and the name and address of the offeror. Offerors using commercial carriers should ensure that the proposal is marked on the outermost wrapper with the information in paragraphs (c)(1)(i) and (c)(1)(ii) of this provision.

(2) The first page of the proposal must show--

(i) The solicitation number;

(ii) The name, address, and telephone and facsimile numbers of the offeror (and electronic address if available);

(iii) A statement specifying the extent of agreement with all terms, conditions, and provisions included in the solicitation and agreement to furnish any or all items upon which prices are offered at the price set opposite each item;

(iv) Names, titles, and telephone and facsimile numbers (and electronic addresses if available) of persons authorized to negotiate on the offeror's behalf with the Government in connection with this solicitation; and

(v) Name, title, and signature of person authorized to sign the proposal. Proposals signed by an agent shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.

(3) *Submission, modification, revision, and withdrawal of proposals.*

(i) Offerors are responsible for submitting proposals, and any modifications or revisions, so as to reach the Government office

designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that proposal or revision is due.

(ii)(A) Any proposal, modification, or revision received at the Government office designated in the solicitation after the exact time specified for receipt of offers is "late" and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late offer would not unduly delay the acquisition; and-

(1) If it was transmitted through an electronic commerce method authorized by the solicitation, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or

(2) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of offers and was under the Government's control prior to the time set for receipt of offers; or

(3) It is the only proposal received.

(B) However, a late modification of an otherwise successful proposal that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(iii) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(iv) If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the solicitation, and urgent Government requirements preclude amendment of the solicitation, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(v) Proposals may be withdrawn by written notice received at any time before award. Oral proposals in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile proposals, proposals may be withdrawn via facsimile received at any time before award, subject to the conditions specified in the provision at 52.215-5, Facsimile Proposals. Proposals may be withdrawn in person by an offeror or an authorized representative, if the identity of the person requesting withdrawal is established and the person signs a receipt for the proposal before award.

(4) Unless otherwise specified in the solicitation, the offeror may propose to provide any item or combination of items.

(5) Offerors shall submit proposals in response to this solicitation in English, unless otherwise permitted by the solicitation, and in U.S. dollars, unless the provision at FAR 52.225-17, Evaluation of Foreign Currency Offers, is included in the solicitation.

(6) Offerors may submit modifications to their proposals at any time before the solicitation closing date and time, and may submit modifications in response to an amendment, or to correct a mistake at any time before award.

(7) Offerors may submit revised proposals only if requested or allowed by the Contracting Officer.

(8) Proposals may be withdrawn at any time before award. Withdrawals are effective upon receipt of notice by the Contracting Officer.

(d) *Offer expiration date.* Proposals in response to this solicitation

will be valid for the number of days specified on the solicitation cover sheet (unless a different period is proposed by the offeror).

(e) *Restriction on disclosure and use of data*. Offerors that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall—

(1) Mark the title page with the following legend:

This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed—in whole or in part—for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of—or in connection with—the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [insert numbers or other identification of sheets]; and

(2) Mark each sheet of data it wishes to restrict with the following legend:

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

(f) *Contract award*. (1) The Government intends to award a contract or contracts resulting from this solicitation to the responsible offeror(s) whose proposal(s) represents the best value after evaluation in accordance with the factors and subfactors in the solicitation.

(2) The Government may reject any or all proposals if such action is in the Government's interest.

(3) The Government may waive informalities and minor irregularities in proposals received.

(4) The Government intends to evaluate proposals and award a contract without discussions with offerors (except clarifications as described in FAR 15.306(a)). Therefore, the offeror's initial proposal should contain the offeror's best terms from a cost or price and technical standpoint. The Government reserves the right to conduct discussions if the Contracting Officer later determines them to be necessary. If the Contracting Officer determines that the number of proposals that would otherwise be in the competitive range exceeds the number at which an efficient competition can be conducted, the Contracting Officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

(5) The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit cost or prices offered, unless the offeror specifies otherwise in the proposal.

(6) The Government reserves the right to make multiple awards if, after considering the additional administrative costs, it is in the Government's best interest to do so.

(7) Exchanges with offerors after receipt of a proposal do not constitute a rejection or counteroffer by the Government.

(8) The Government may determine that a proposal is unacceptable if the prices proposed are materially unbalanced between line items or subline items. Unbalanced pricing exists when, despite an acceptable total evaluated price, the price of one or more contract line items is significantly overstated or understated as indicated by the application of cost or price analysis techniques. A proposal may be rejected if the Contracting Officer determines that the lack of balance poses an unacceptable risk to the Government.

(9) If a cost realism analysis is performed, cost realism may be

considered by the source selection authority in evaluating performance or schedule risk.

(10) A written award or acceptance of proposal mailed or otherwise furnished to the successful offeror within the time specified in the proposal shall result in a binding contract without further action by either party.

(11) The Government may disclose the following information in postaward debriefings to other offerors:

(i) The overall evaluated cost or price and technical rating of the successful offeror;

(ii) The overall ranking of all offerors, when any ranking was developed by the agency during source selection;

(iii) A summary of the rationale for award; and

(iv) For acquisitions of commercial items, the make and model of the item to be delivered by the successful offeror.

(End of provision)

6 CHANGES PRIOR TO RECEIVING OFFERS

The right is reserved, as the interest of the Government may require, to revise the specifications and/or Request For Proposal drawings prior to the date set for receiving offers. Such revisions will be announced by an amendment or amendments to this Request For Proposal. It shall be the responsibility of the prospective offeror, subcontractor or supplier to obtain copies of amendments from the website listed in paragraph: PLAN HOLDER'S LIST below. The Government may (but not required) send an amendment notification to let prospective offerors know that an amendment has been issued.

7 (FAR 52.216-1) TYPE OF CONTRACT (APR 1984) .

The Government contemplates award of a firm fixed price contract resulting from this solicitation.

(End of provision)

8 (FAR 52.204-6) DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (JUNE 1999)

(a) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation "DUNS" followed by the DUNS number that identifies the offeror's name and address exactly as stated in the offer. The DUNS number is a nine-digit number assigned by Dun and Bradstreet Information Services.

(b) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one. A DUNS number will be provided immediately by telephone at no charge to the offeror. For information on obtaining a DUNS number, the offeror, if located within the United States,

should call Dun and Bradstreet at 1-800-333-0505. The offeror should be prepared to provide the following information:

- (1) Company name.
- (2) Company address.
- (3) Company telephone number.
- (4) Line of business.
- (5) Chief executive officer/key manager.
- (6) Date the company was started.
- (7) Number of people employed by the company.
- (8) Company affiliation.

(c) Offerors located outside the United States may obtain the location and phone number of the local Dun and Bradstreet Information Services office from the Internet home page at <http://www.customerservice@dnb.com>. If an offeror is unable to locate a local service center, it may send an e-mail to Dun and Bradstreet at globalinfo@mail.dnb.com.

(End of provision)

9 SMALL BUSINESS SIZE STANDARD.

The small business size standard is gross annual receipts for its preceding 3 fiscal years did not exceed 27.5 million.

10 NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS).

In accordance with Subsector 233 of the NAICS Manual, the work in this solicitation is assigned classification code 233320 (1542 SIC Code).

11 (DFARS 252.204-7004) REQUIRED CENTRAL CONTRACTOR REGISTRATION (NOV 2001)

(a) Definitions.

As used in this clause--

(1) "Central Contractor Registration (CCR database" means the primary DoD repository for contractor information required for the conduct of business with DoD.

(2) "Data Universal Numbering System (DUNS) number" means the 9-digit number assigned by Dun and Bradstreet Information Services to identify unique business entities.

(3) "Data Universal Numbering System +4 (DUNS+4) number" means the DUNS number assigned by Dun and Bradstreet plus a 4-digit suffix that may be assigned by a parent (controlling) business concern. This 4-digit suffix may be assigned at the discretion of the parent business concern for such purposes as identifying subunits or affiliates of the parent business concern.

(4) "Registered in the CCR database" means that all mandatory information, including the DUNS number or the DUNS+4 number, if applicable, and the corresponding Commercial and Government Entity (CAGE) code, is in the CCR database; the DUNS number and the CAGE code have been validated; and all edits have been successfully completed.

(b)(1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee must be registered in the CCR database prior to award, during performance, and through final payment of any contract resulting from this solicitation, except for awards to foreign vendors for work to be performed outside the United States.

(2) The offeror shall provide its DUNS or, if applicable, its DUNS+4 number with its offer, which will be used by the Contracting Officer to verify that the offeror is registered in the CCR database.

(3) Lack of registration in the CCR database will make an offeror ineligible for award.

(4) DoD has established a goal of registering an applicant in the CCR database within 48 hours after receipt of a complete and accurate application via the Internet. However, registration of an applicant submitting an application through a method other than the Internet may take up to 30 days. Therefore, offerors that are not registered should consider applying for registration immediately upon receipt of this solicitation.

(c) The Contractor is responsible for the accuracy and completeness of the data within the CCR, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the CCR database after the initial registration, the Contractor is required to confirm on an annual basis that its information in the CCR database is accurate and complete.

(d) Offerors and contractors may obtain information on registration and annual confirmation requirements by calling 1-888-227-2423, or via the Internet at <http://www.ccr.gov>.

(End of clause)

12 (FAR 52.236-28) PREPARATION OF PROPOSALS—CONSTRUCTION (OCT 1997)

(a) Proposals must be (1) submitted on the forms furnished by the Government or on copies of those forms; and (2) manually signed. The person signing a proposal must initial each erasure or change appearing on any proposal form.

(b) The proposal form may require offerors to submit proposed prices for one or more items on various bases, including—

- (1) Lump sum price;
- (2) Alternate prices;
- (3) Units of construction; or
- (4) Any combination of paragraphs (b)(1) through (b)(3) of this provision.

(c) If the solicitation requires submission of a proposal on all items, failure to do so may result in the proposal being rejected without further consideration. If a proposal on all items is not required, offerors should insert the words "no proposal" in the space provided for any item on which no price is submitted.

(d) Alternate proposals will not be considered unless this solicitation authorizes their submission.

(End of provision)

13 (FAR 52.233-2) SERVICE OF PROTEST (AUG 1996).

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgement of receipt from District Counsel, 106 South 15th Street, Omaha, Nebraska 68102-1618.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

14 (FAR 52.236-27) SITE VISIT (CONSTRUCTION) (FEB 1995).

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) A site visit and pre-proposal conference is scheduled for 07 January 2002 at the proposed Construction Site at 1:00 p.m. (local time). All contractors must contact the Corps of Engineers Buckley Resident Office no later than 2 January 2002 so that arrangements can be made with the Security Police to allow the Contractors onto the base. The Point of Contact at the Resident Office is Eric Petersen, phone (303) 367-0335 or (303) 367-0316. The fax number at the Resident Office is (303) 367-0357. Contractors shall furnish the following information to the Resident Office: Name of Contractor or firm, names, Social Security Numbers, Date of Birth, Place of Birth, Driver's License Number, and Citizenship of each person who will attend. This information will be furnished to the Security Police at the Sixth Avenue Entry Control Point (ECP). On the day of the Site Visit, Contractors should enter the base at the Sixth Avenue Gate and present photo ID's to the Guards at the ECP, then proceed to the Pass & ID Building just inside the gate to obtain a Vehicle Pass. Note that the check-in procedure and issuance of a vehicle pass normally takes 10-15 minutes. Once a vehicle pass is issued, Contractors should proceed directly to the project site. A pre-proposal conference will be held immediately following the site visit. Questions regarding the site visit should be directed to the Resident Office at the number listed above. Access to Buckley AFB will be denied for anyone failing to comply with the requirements stated herein.

15 OFFEROR'S QUESTIONS AND COMMENTS.

Questions and/or comments relative to these documents should be submitted via e-mail or mailed to: U.S. Army Corps of Engineers, Omaha District, ATTN: CENWO-CT-M 106 South 15th Street, Omaha, NE 68102-1618. Comments should reach this office no later than 20 calendar days prior to the date set for receiving of proposals, if feasible, in order that changes, if needed, may be added by amendment. E-mail addresses, FAX numbers, items for question and points of contact are listed below. Phone calls with questions should be made between 8:30 a.m. and 3:30 p.m. (Central Standard Time) Monday through Friday.

Note: A courtesy copy of all questions shall be sent to the Contract Specialist (Contractual Matters Point of Contact), the Program Manager and the Specifications Section (Technical Contents Points of Contact), except for Small Business questions. Small Business questions shall go to the Small Business Matters point of contact.

<u>Items for Question</u>	<u>Points of Contact/ Phone numbers/ FAX Numbers</u>	<u>E-mail Addresses</u>
Contractual Matters: Ordering CD-Rom of the proposal documents (limit One per firm)/ amendments**/ Receipt of Proposals	Loreen Blume 402-221-4265 (phone) 402-221-4199 (fax)	loreen.k.blume@usace.army.mil
Planholder's List	See paragraph: PLAN HOLDER'S LIST, below.	
Small Business Matters	Hubert Carter 402-221-4110 (phone)	hubert.j.carter@usace.army.mil
Technical Contents Of Proposal Documents	Larry Sand 402-221-4595 (phone) 402-221-4828 (fax)	larry.d.sand@usace.army.mil
Or		
	Specifications Section Doug Larsen 402-221-4547 402-221-3842	douglas.r.larsen@usace.army.mil
Site Inspection	See Paragraph: SITE INSPECTION, above	

**** - The Government may elect to send a notification that an amendment has been posted to the Government's web address, but is not required to. It shall be the Contractor's, Subcontractor's and Supplier's responsibility to check the Government's web address for amendments.**

15.1 PLAN HOLDER'S LIST.

The CD-Rom will provide a list of plan holders that have registered at the time the CD-Rom was created. It is offeror's responsibility to check for any updates to the plan holder's list, which is available at the following web address:

<http://ebs.nwo.usace.army.mil/ebs/contract.htm>

16 GENERAL DESCRIPTION OF WORK.

Scope of project includes all work required to design and construct a Physical Fitness Center located at Buckley AFB, Colorado. Work shall be in accordance with Request for Proposal documents issued with this solicitation.

17 PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS.

See Section 00110 PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS.

18 SOURCE SELECTION BOARD (SSB).

The Contracting Officer has established a Source Selection Board to conduct an evaluation of each proposal received in response to this Solicitation. The evaluation will be based exclusively on the merits and content of the proposal and any subsequent discussion required. The identities of the SSB personnel are confidential, and any attempt by the proposers to contact these individuals is prohibited.

19 PROPOSAL EVALUATION AND CONTRACT AWARD

See Section 00120 PROPOSAL EVALUATION AND CONTRACT AWARD

20 COLORADO SALES AND USE TAX.

Specific exemption from the Colorado Sales and Use Taxes will be granted by the Colorado Tax authorities with respect to all materials used by a prime Contractor or subcontractor and which are built into structures furnished under contract to a Government agency. The Colorado Sales and Use Taxes shall be excluded from the bid prices. Exemption certificates are available to both Contractors and subcontractors provided personal application is made therefor to the Department of Revenue, State of Colorado, State Capitol Annex, Denver, Colorado. The Contractor or subcontractor will be required to submit the date of the contract, the amount of the contract, and the proposed date for completion of the contract. Telephone: (303) 534-1208 (General Information).

21 (FAR 52.232-18) AVAILABILITY OF FUNDS (APR 1984).

Funds are not presently available for this contract. The Government's obligation under this contract is contingent upon the availability of appropriated funds from which payment for contract purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this contract and until

the Contractor receives notice of such availability, to be confirmed in writing by the Contracting Officer. (FAR 52.232-18)

REQUIRED CENTRAL CONTRACTOR REGISTRATION (CCR)

Register Now: Don't wait until you submit an offer on solicitation. You must be registered to receive the contract award. It can often take 30 days for CCR to process your registration information.

Register One of Three Ways:

Internet: <http://www.ccr.gov>

Value Added Network (VAN) for EDI users: Contact your information. If you need to find a VAN look at http://www.acq.osd.mil/ec/ecip/van_list.htm

FAX or Mail: Call (888)227-2423 or (616)961-4725 to receive registration package. FAX or mail the completed information to CCR Assistance Center. It can take up to 30 days to process faxed or mailed package.

CCR Assistance Center
74 Washington Street North, Suite 7
Battle Creek, MI 49017-3084
FAX: (616)961-7243

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SECTION 00110

PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS

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SECTION 00110

PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS

1. PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS

1.1 WHO MAY SUBMIT.

This solicitation is unrestricted and open to both large and small business participation.

1.2 GENERAL REQUIREMENTS.

In order to effectively and equitably evaluate all proposals, the Contracting Officer must receive information sufficiently detailed to clearly indicate compliance with the proposal submission requirements.

1.3 SIZE OF PRINTED MATTER SUBMISSIONS.

All written portions shall be in 8-1/2" x 11" format.

1.4 WHERE TO SUBMIT.

Offerors shall submit their proposal packages to the USACE Contracting Activity at the address shown in Block 8 of Standard Form 1442.

1.5 SUBMISSION DEADLINE.

Proposals shall be received by the USACE Contracting Activity no later than the time and date specified in block 13 of Standard Form 1442.

1.6 PROPOSAL REQUIREMENTS AND SUBMISSION FORMAT.

Offerors shall submit the original and five (5) copies of their proposal, each consisting of a 3-ring binder with Tabs (dividers) separating the sections, as described herein:

Tab 1 – Design Experience, Design Personnel, and Past Performance (Design)

Tab 2 - Construction Experience

Tab 3 – Past Performance, Construction

Tab 4 – Construction Personnel

Tab 5 – Project Management Plan (PMP)

Tab 6 – Utilization of Small Business Concerns

Tab 7 - Price

All proposals shall contain the evaluation requirements stated herein and every binder shall also contain: Table of

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Contents, List of Tables (if required), List of Figures (if required), List of Appendixes, and Name/Address/Telephone Number of the Offeror. Proposal clarity, organization (as requested in this solicitation) and cross referencing is mandatory. No material (information not part of proposal) shall be incorporated by reference. The offeror shall submit in the proposal the requested information specified below. Note that the evaluation factors listed herein, other than Price, are listed in descending order of importance.

1.6.1 TAB 1 - Design Experience, Design Personnel And Past Performance (Design).

The offeror shall submit in the proposal the requested information specified in this paragraph. Provide a combined Standard Form (SF) 255 for the entire design team and a separate SF 254 for each firm included with the design team. On the combined SF 255 include your past experience as a prime design/build agent, joint venturer, or for joint ventures formed for this contract only, design agent experience in comparable projects. If you do not want the data submitted disclosed by the Government, follow the procedure specified in Section 00100 INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS, paragraph: RESTRICTION ON DISCLOSURE AND USE OF DATA.

1.6.1.1 Design Experience. Design team shall have recent experience in designing Fitness Facilities of similar scope and complexity as this project. Submit 7 projects designed by your firm that most clearly illustrate your experience, preferably in designing facilities similar to the Physical Fitness Center. In addition, these projects should demonstrate applicable Military Design experience and Design/Build experience. Provide project examples in Block 8 of SF 255. No more than 7 projects may be submitted. Submission of fewer than 7 projects will reduce the proposer's rating in this category. Include a brief scope description for each project. Project examples should include at least one project containing: military construction project for a U.S. Government Agency (Preferably design/build and Fitness facility). Project examples may also include non-government private sector design-build facilities of similar type, non design-build military construction projects of similar type, and non-military, non-design build private sector facilities of similar type. Projects should be at least \$8,000,000 in construction cost and completed within the past 5 years of the date that proposals for the Physical Fitness Center are due. Project examples should include past experience as a prime design-build agent or joint venturer. If a joint venture has been formed for this contract only, include a brief description of previous experience with the Construction Contractor.

1.6.1.2 Design Personnel. Include resumes of lead and support design personnel who will work on this project in Block 7 of SF 255. The design team should be composed of project managers, registered architects, or engineers, or a multi-discipline design firm with project managers, registered architects and engineers on staff providing complete facility design services. Project Managers and Lead designers should be registered professional architects or engineers (preferably registered in the state of Colorado) with at least 5 years experience as a registered professional in the design of similar projects. Include example of projects the Project Manager and lead designers/design team has worked on together. Preferably include at least one project containing: a military construction project for a U.S. Government Agency (design/build and military Fitness facility). Project examples may also include non-government design build facilities of similar type, non design-build military construction projects of similar type, and non-military, non-design build private sector facilities of similar type. Projects should be at least \$8,000,000 in construction cost and completed within the past 5 years of the date that proposals for the Physical Fitness Center are due. The design team must include the following disciplines:

- Project Manager (Registered Architect or Engineer)
- Registered Architect
- Registered Structural Engineer with training related to the 1997 National Earthquake Hazard Reduction Program (NEHRP)
- Registered Mechanical Engineer
- Registered Electrical Engineer
- Registered Fire Protection Engineer

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- Registered Civil Engineer
- Registered Landscape Architect
- Interior Designer - Certified by the National Council of Interior Designers Qualifications (NCIDQ)

If, because of reasons beyond the control of the design team, the named individuals are not able to fulfill this obligation, replacement personnel with similar education and experience shall be presented for acceptance by the Contracting Officer.

1.6.1.3 Past Performance (Design). Provide copies of all Performance Evaluations (Architect-Engineer) received on DOD government design projects within the last 6 years. Copies of records contained in the Corps of Engineers ACASS (Architect-Engineer Contract Administration Support System) Database may be requested by fax on company letterhead at the following telefax number: (503) 808-4596. The proposal shall contain these ACASS evaluations.

1.6.2 TAB 2 – Construction Experience.

In this tab, the offeror should submit seven (7) project summaries of construction projects which best illustrate his experience on projects of a similar type as the PFC. Each project summary should consist of a one or two page narrative of the project, discussing the project and providing specifics as noted herein. No more than 7 projects may be submitted. However, if 7 construction projects are not included in the proposal, the firm's proposal will be evaluated less favorably than those firms submitting 7. Each project cited should have a construction dollar value of at least \$8,000,000 and completed within the past five (5) years. Indefinite-Delivery, Indefinite Quantity (IDIQ) Contracts, where numerous Task Orders are summed to meet the minimum construction dollar value identified herein, are not acceptable. Only those projects for which the offeror was the prime contractor should be submitted. The summaries should include project examples that are similar to the PFC. Include at least one military construction project of a similar type as the PFC. Summaries may also include non-government private sector facilities of similar type. Each summary shall include: a description of the project; construction contract award amount; final construction cost; location; date when the project was started; original contract finish date and actual finish date. All summaries shall contain the name, address, telephone and fax number of a representative of the owner (as well as one alternate individual not affiliated with your firm) familiar with your firm's experience on the project that can verify the experience cited. If you do not want the data submitted disclosed by the Government, follow the procedure specified in Section 00100 INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS paragraph 5 (e): RESTRICTION ON DISCLOSURE AND USE OF DATA.

1.6.3 TAB 3 - Past Performance, Construction.

Provide copies of all Construction Contractor Appraisal Support System (CCASS) Performance Evaluations (Construction) received on DOD government projects within the last 5 years and, for each project for Private Industry submitted as a summary in paragraph 1.6.2 above, provide a completed Performance Summary Sheet for each project. Copies of records contained in the Corps of Engineers CCASS Database may be requested by fax on company letterhead at the following telefax number: (503) 808-4596. For performance evaluation on DOD or non-DOD government projects, the Government reserves the right to contact the evaluator to verify your firm's construction experience. A blank copy of the Performance Summary Sheet is attached to this section. This form must be completed by an owner or owner's representative and included in the proposal.

1.6.4 TAB 4 - Construction Personnel.

In this tab, the proposer should present the names and resumes for key construction personnel that will be assigned to this project. In addition, provide a summary of the duties and responsibilities of these individuals which clearly indicate separate duties and responsibilities for each individual. As a minimum, this tab should include data on the

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following personnel:

Project Manager

Project Superintendent

CQC System Manager

The proposal shall clearly present the credentials of each person, and shall show that each meets the requirements listed below. Resumes should include examples of project experience (including what capacity the individual served on each project), as well as the dates employed on each project, and the monetary size of each project cited as experience. In addition, the educational qualifications of the proposed personnel shall be submitted. Prior experience on military construction projects is preferred and will be evaluated more favorably. If, because of reasons beyond the control of the construction firm, the individuals named in this proposal are not able to be utilized on this project, replacement personnel with similar skills and experience shall be presented for acceptance and approval by the Contracting Officer. Replacement individuals for this project shall be required to have qualifications and experience meeting or exceeding those identified in the proposal.

1.6.4.1 Project Manager. The Project Manager should be a registered engineer, registered architect or graduate construction manager and should have at least 5 years experience as a Project Manager on projects similar to this project.

1.6.4.2 Project Superintendent. The Project Superintendent should be a graduate engineer or experienced construction person and should have at least 5 years experience as a Project Superintendent on projects similar to this project.

1.6.4.3 Contractor Quality Control (CQC) System Manager. The Contractor Quality Control System (CQC) Manager should be a graduate engineer or experienced construction person with a minimum of 5 years experience as a CQC System Manager on projects similar to the PFC.

1.6.5 TAB 5 – Project Management Plan (PMP).

This tab shall include a comprehensive PMP developed specifically for this project. The information in the PMP should make it clear that the offeror has the ability to deliver a quality product and effectively manage the designers, consultants and subcontractors on the team, as well as the ability to coordinate all work throughout the design and construction phases. The PMP shall include an explanation of the total project team management approach for both the design team and the construction team. It shall include : management of firms included within the design team and construction team, specific quality control procedures used (including Quality Control procedures to be used to limit re-submittals, design errors, and poor coordination between the prime design firm and design consultant), schedule development, and methods to be utilized to adhere to the schedule. In addition, it should address the acquisition of environmental permits in a timely fashion, safety, preparation and submission of As-Built documents, and contract close-out. It should discuss how the design team will support the Contractor during construction and an organizational chart showing the inter-relationship of management and various team components. In addition, the PMP should address the relationship between designer and construction contractor and should clearly indicate an understanding of the design-build process.

1.6.6 TAB 6 – Utilization of Small Business Concerns.

The Offeror, if not a Small Business Concern, shall demonstrate how the firm plans to identify, commit and utilize Small Business (SB), Small Disadvantaged Business (SDB), HUBZone Small Business, Women-owned Small

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Business (**WOSB**) concerns, Severely Disabled Veterans (**SDV**), and Historical Black Colleges and Minority Institutions (**HBCU/MI**) as team members, subcontractors and/or suppliers in the performance of the resultant contract of this solicitation. It is the policy of the U.S. Army Corps of Engineers, Omaha District (CENWO) that small business concerns have the maximum practicable opportunity to participate in performing contracts let by the Contracting Activity (CENWO-CT). It is further the policy of the CENWO that its large-business prime contractors demonstrate the extent they plan to utilize small business concerns in any resultant contract and provide assurance in its offer that small business concerns will have maximum subcontracting opportunities in its prime contracts. If the contractor is a Small Business Concern, this tab may include a single sheet stating that the contractor is a Small Business Concern, in lieu of compiling the information requested herein.

1.6.6.1 Definitions:

- a. Small Business Concerns. For the purpose of this section, small business concerns refer to Small Business, Small Disadvantaged Business, Women-owned Small Business, HUBZone Small Business, Severely Disabled Veterans (SDV), Historically Black College and University and Minority Institutions.
- b. Prime Contractor. For the purpose of this section, a prime contractor refers to both large and small contractors.
- c. Offeror: For the purpose of this section, offeror refers to both large and small contractors.
- d. Floor: "Floor" is the term the U.S. Army Corps of Engineers use to replace goal. It represents the minimum level for small business performance.

1.6.6.2 The Offeror's proposal should demonstrate the utilization and participation of small business concerns. The proposal should clearly state factors that demonstrate a strong commitment to use small business concerns. Enforceable commitments to use small business concerns will be weighed more heavily than non-enforceable ones. The evaluation of utilization and participation of small business concerns is separate and distinct from the requirement at Federal Acquisition Regulation (FAR) Clause 52.219-9, Small Business Subcontracting Plan.

1.6.6.3 This tab, as a minimum, should include:

Subparagraphs are listed in descending order of importance for purposes of proposal evaluation.

a. Development of percentage floors based on planned subcontracting which is challenging yet realistic. The following floors are considered reasonable and obtainable for requirements awarded in Fiscal Year 2002.

- (i) 61.4% of planned subcontracting dollars to be placed with all small business concerns.
- (ii) 9.1% of planned subcontracting dollars to be placed with those small business concerns owned and controlled by socially and economically disadvantaged individuals.
- (iii) 5.0% of planned subcontracting dollars to be placed with women-owned small business concerns.
- (iv) 3.0% of planned subcontracting dollars with Severely Disabled Veterans Small Business concerns.
- (v) 2.5% of planned subcontracting dollars with Hubzones Small Business Concerns.

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b. Past Performance in Meeting Small Business Floors. Demonstrate how floors for SB, SDB and WOSB participation were satisfied on previous contracts. Extent to which the prime has historically been successful in establishing realistic yet challenging goals and evidences ability to achieve them. The Offeror should submit data on Past Performance in meeting small business goals which will demonstrate how goals for small business concerns participation on previous contracts was satisfied. The data to be provided should include: (1) Client/Customer (2) Contract/Identification Number (3)Project Description (4) Contract Amount (5) Reference or Point of Contract (to include address and telephone number).

c. Demonstrate utilization and participation of small business concerns, clearly stated factors that demonstrate strong commitments to use SB, SDB, WOSB, SDV, and HBCU/MI as team members, subcontractors, and/or suppliers.

d. Description of supplies and services to be subcontracted and planned for subcontracting to SBs, SDBs, WOSBs, SDVs, and HBCUs/MIs.

e. Assurances that the offeror will include the clause at FAR 52.219-8, Utilization of Small Business Concerns in all subcontracts that offer further subcontracting opportunities, and that the offeror will require subcontractor (including small business concerns) that receive subcontracts in excess of \$500,000 (\$1,000,000 for construction) to adopt a small business participation program similar to the requirements of the resultant contract.

1.6.7 TAB 7 - Price. In this tab, the offeror shall submit the information specified herein.

1.6.7.1 Section 00010, Solicitation/Contract Form and Pricing Schedule. The total cost for the construction will be considered for evaluation. Proposed price will be utilized in the establishment of the competitive range.

1.6.7.2 Section 00600, Representations, Certifications and Other Statements of Offerors.
This item is not considered for evaluation, but is a required item.

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PHYSICAL FITNESS CENTER (PFC), BUCKLEY AFB, CO

PERFORMANCE SUMMARY SHEET (Part 1)

SOLICITATION NUMBER DACA45-02-R-0001

Contractor's Name: _____

Project Name: _____

Project Location: _____

Name & Title of Person Completing this Summary _____

Name of Firm of Person Completing this Summary: _____

Signature of Person Completing this Summary: _____

Date: _____ Phone Number: _____

1. Overall Rating of this Contractor:

- _____ Outstanding
- _____ Above Average
- _____ Satisfactory
- _____ Marginal
- _____ Unsatisfactory

2. Cost Growth:

Original Construction Contract Award Amount: _____

Final Construction Contract Amount: _____

In your opinion, which of the following statement best describes your experience with cost growth on this project:

- _____ a. The contractor did not contribute to any cost growth.
- _____ b. The contractor contributed to some degree to the cost growth experienced on this project.
- _____ c. The contractor contributed significantly to the cost growth experienced on this project.

Any additional cost growth comments:

PERFORMANCE SUMMARY SHEET (Part 2)

SOLICITATION NUMBER DACA45-02-R-0001

3. Time Growth:

Original Contract Completion Date: _____

Final Contract Completion Date: _____

In your opinion, which of the following statement best describes your experience with time growth on this project:

____ a. The contractor did not contribute to any time growth.

____ b. The contractor contributed to some degree to the time growth experienced on this project.

____ c. The contractor contributed significantly to the time growth experienced on this project.

Any additional time growth comments:

4. Quality: Which of the following statements most accurately describe the quality of the work the contractor provided on your project:

____ a. The work provided by the contractor was of high quality.

____ b. The work provided by the contractor was of fair quality.

____ c. The work provided by the contractor was of poor quality.

Any additional comments on quality:

5. The willingness of past customers to have a contractor perform more work for them is an indication of overall satisfaction with the contractor's performance. If you were to construct another project similar to the one recently completed, and you had the responsibility and total authority to select the contractor for the new project, which of the following statements most accurately depicts the approach you would take?

____ a. I would have this contractor construct the new project.

____ b. I would consider this contractor, but I would also explore the possibility of using other contractors to construct the project.

____ c. I would not consider using this contractor to construct the new project.

6. Any additional comments (additional sheets may be added, if necessary):

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SECTION 00120

PROPOSAL EVALUATION AND CONTRACT AWARD

INDEX

- 1. EVALUATION OF PROPOSALS.**
- 2. EVALUATION FACTORS FOR AWARD.**
 - 2.1 FACTOR - DESIGN EXPERIENCE, DESIGN PERSONNEL, AND PAST PERFORMANCE (DESIGN) (TAB 1)**
 - 2.2 FACTOR - CONSTRUCTION EXPERIENCE (TAB 2)**
 - 2.2 FACTOR - PAST PERFORMANCE, CONSTRUCTION (TAB 3)**
 - 2.3 FACTOR - CONSTRUCTION PERSONNEL (TAB 4)**
 - 2.4 FACTOR - PROJECT MANAGEMENT PLAN (TAB 5)**
 - 2.5 FACTOR - UTILIZATION OF SMALL BUSINESS CONCERNS (TAB 6)**
- 3. EVALUATION OF PRICE (TAB 7).**
- 4. COMPETITIVE RANGE.**
- 5. FINAL PROPOSAL REVISIONS.**

SECTION 00120

PROPOSAL EVALUATION AND CONTRACT AWARD

1. EVALUATION OF PROPOSALS.

a. All proposals and documentation which have been properly submitted will be evaluated. Proposals received will be evaluated on the basis of the factors stated in the solicitation to select the responsible offeror whose proposal is most advantageous to the Government. Because of the number of proposals anticipated, uniformity of all proposals is essential to assure fair and accurate evaluation. All proposals must comply with the instructions in the solicitation.

b. All responsible offerors whose proposal has a reasonable chance of being selected will be included in the competitive range.

c. Discussions with owners, contract administrators, or other points of contact, provided by the offeror may affect the evaluation rating given for the factors being evaluated by those discussions.

d. Evaluations will be conducted in accordance with the Tradeoff Process, FAR 15.101-1. Tabs 1 through 6 will be rated using an adjectival methodology with a narrative assessment and Tab 7 (Price) will be evaluated after consensus scoring Tabs 1-6. Proposal evaluation is an assessment of the proposal and the offeror's ability to perform the resultant contract successfully. Proposals will be evaluated to determine ratings supported by narratives, and to identify strengths, weaknesses, and deficiencies of the proposed approach in each proposal.

e. Evaluation Definitions.

(1) Strength. A substantive aspect, attribute, or specific item in the proposal that exceeds the solicitation requirements and enhances the probability of successful contract performance.

(2) Weakness. A flaw in the proposal that increases the risk of unsuccessful contract performance. A significant weakness in the proposal is a flaw that appreciably increases the risk.

(3) Deficiency. A material failure of a proposal to meet a Government requirement or a combination of significant weaknesses in a proposal that increases the risk of unsuccessful contract performance to an unacceptable level.

(4) Clarification. Clarifications are limited exchanges between the Government and offerors that may occur when award without discussions is contemplated. If award without discussions is anticipated, offerors may be given the opportunity to clarify certain aspects of their proposals or to resolve minor or clerical errors.

(5) Communications. Communications are exchanges between the Government and offerors after receipt of proposals, leading to establishment of the competitive range.

(6) Discussions. Discussions are negotiations conducted in a competitive acquisition and take place after establishment of the competitive range. Discussions are tailored to each offeror's proposal, and shall be conducted

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by the Contracting Officer with each offeror within the competitive range.

(7) Rating. The application of a scale of words, colors, or numbers, used in conjunction with narrative, to denote the degree to which the proposal has met the standard for a non-cost factor. For purposes of this solicitation, ratings will consist of words (adjectival method) used in conjunction with narratives. Ratings will be applied at the factor (tab) and subfactor level. If at any level of indentation an Offeror's proposal is evaluated as not meeting a minimum requirement (that is, below the level of acceptable), this fact must be included in the rating and narrative assessment at that level and each higher level of indentation. Therefore, a marginal or unacceptable rating at any level must be carried to the factor (tab) level. The following ratings will be used to evaluate Tabs 1 through 6:

a. Exceptional. Exceeds minimum requirements of the RFP in a beneficial way to the government and has no significant weakness.

b. Acceptable. Meets minimum requirements of the RFP and any weaknesses are readily corrected.

c. Marginal. Fails to meet a minimum requirement of the RFP; however, any deficiencies are correctable without a major revision of the proposal.

d. Unacceptable. Fails to meet a minimum requirement of the RFP and the deficiency is uncorrectable without a major revision of the proposal.

2. EVALUATION FACTORS FOR AWARD.

The areas to be evaluated include Evaluation Factors which will be evaluated based on the adjectival method of evaluation. The requirements specified in the solicitation are considered to be minimum requirements. A more favorable evaluation rating may be given for exceeding the minimum requirements.

EVALUATION FACTORS

Design Experience, Design Personnel, and Past Performance (Design) (Tab 1)
Construction Experience (Tab 2)
Past Performance, Construction (Tab 3)
Construction Personnel (Tab 4)
Project Management Plan (Tab 5)
Utilization of Small Business Concerns (Tab 6)

SUBJECTIVELY EVALUATED FACTORS

Price (Tab 7)

Note that the evaluation factors listed above, other than Price, are listed in descending order of importance. A low evaluation rating for any tab, or combination of different tabs, may cause the proposal to be evaluated as unsatisfactory. Price (Tab 7) will be evaluated in accordance the requirements listed in paragraph: EVALUATION OF PRICE below.

2.1. FACTOR -- DESIGN EXPERIENCE, DESIGN PERSONNEL AND PAST PERFORMANCE (DESIGN) (TAB 1)

a. Design Experience

The experience of the offeror's design team in the design of Physical Fitness Facilities will be evaluated. Previous experience (Project examples) on military, government agency, and/or non-military designs and design-build contracts are areas of consideration. Relatable military and design-build project experience will be evaluated more favorably than projects that are not military design projects or design-build. Relatable non-military and non-design-build experience will be evaluated less favorably.

b. Design Personnel

Qualifications of key design personnel assigned to this project (experience, professional registration and education as important factors) will be evaluated. Relatable military design-build project experience for lead personnel will be evaluated more favorably than projects which are not military or design-build. In descending order of importance, lower ratings will be given for relatable non-military design-build, military design, and non-military design experience. More favorable ratings are awarded for projects where personnel have previous experience with other members of the design team. More favorable ratings are awarded if lead personnel are registered in the state of Colorado.

c. Past Performance (Design)

Past Performance rating received on prior DOD government work will be evaluated. Excellent evaluations will be evaluated more favorably than past evaluations of Above Average, Average, Below Average, and Poor. If an offeror has no past performance evaluations within the ACASS database a neutral rating will be awarded.

2.2. FACTOR -- CONSTRUCTION EXPERIENCE (TAB 2)

The Construction Contractor's experience in construction of facilities similar to the PFC will be evaluated. Previous experience, cited by project narratives (project summaries), on military, government, and Private Industry projects are areas of consideration. Higher evaluation ratings will be given for those projects which are similar to the PFC and which clearly demonstrate a contractor's capabilities to construct a facility of this size, and to execute the project successfully while containing costs and maintaining schedule. In addition, the projects selected should clearly demonstrate military construction and/or design/build capabilities of the proposer.

2.3. FACTOR -- PAST PERFORMANCE, CONSTRUCTION (TAB 3)

The following items will be evaluated:

Construction CCASS Ratings
Performance Summary Ratings

Past Performance ratings received on prior DOD government work and Performance Summary Sheets (one required for each Private Industry project used as an example for "TAB 2- Construction Experience" portion of this proposal) will be evaluated. Higher evaluation ratings will be awarded for Outstanding evaluations. In descending

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order, lower ratings will be given for past evaluations of Above Average, Satisfactory, Marginal, and Unsatisfactory. If an offeror has no past performance evaluations within the CCASS database or Performance Summary Sheets included in the proposal, a neutral evaluation will be awarded.

The Past Performance rating received on all CCASS ratings for the last five years, as well as all ratings received on the Performance Summary Sheets will be evaluated. Higher ratings will be given for CCASS Ratings equivalent to those found in the Performance Summary Ratings (e.g., an "Above-Average" CCASS rating will be evaluated more favorably than an "Above-Average" rating from a Performance Summary Sheet). The Government may contact the raters for either the CCASS Rating or the Performance Summary Sheets. Furthermore, the government reserves the right to verify the CCASS ratings provided, as well as research the CCASS database for other ratings not provided in the proposal documents. Information furnished for each project and information received from references will affect the evaluation rating awarded.

2.4. FACTOR -- CONSTRUCTION PERSONNEL (TAB 4)

Qualifications of key construction personnel assigned to this project will be considered. More favorable evaluation ratings will be given for military construction project experience, longevity of experience at the position being proposed, and education. In addition, the proposed personnel will be reviewed to insure the requirements for that position identified in SECTION: PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS are met, and evaluation ratings will be reduced for those requirements which are not met.

2.5. FACTOR -- PROJECT MANAGEMENT PLAN (TAB 5)

The quality of the offeror's plan to deliver a quality product and effectively manage the construction team and ability to effectively coordinate all work throughout the design and construction phase of this project will be evaluated. The information in the PMP should make it clear that the offeror has the ability to deliver a quality product and effectively manage the designers, consultants and subcontractors on the team, as well as the ability to coordinate all work throughout the design and construction phases. The PMP shall include an explanation of the total project team management approach for both the design team and the construction team. It shall include : management of firms included within the design team and construction team, specific quality control procedures used (including Quality Control procedures to be used to limit re-submittals, design errors, and poor coordination between the prime design firm and design consultant), schedule development, and methods to be utilized to adhere to the schedule. In addition, it should address the acquisition of environmental permits in a timely fashion, safety, preparation and submission of As-Built documents, and contract close-out. It should discuss how the design team will support the Contractor during construction and an organizational chart showing the inter-relationship of management and various team components. In addition, the PMP should address the relationship between designer and construction contractor and should clearly indicate an understanding of the design-build process. Higher evaluation ratings can be achieved with a thoroughly explained Project Management Plan suitable for the scope and complexity of this project, and which addresses each of the following:

- Management Approach
- Sub-Contractor Management
- Quality Control Procedures
- Schedule development and adherence
- Organization Chart
- Acquisition of Environmental Permits
- Safety
- Preparation and submission of As-Built documents

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- Contract close-out.

2.5. FACTOR -- UTILIZATION OF SMALL BUSINESS CONCERNS (TAB 6)

See Section 00110, paragraph UTILIZATION OF SMALL BUSINESS CONCERNS for areas of evaluation.

The apparently successful offeror will be required to submit an acceptable subcontracting plan in accordance with FAR Clause 52.219.9, Small Business Subcontracting Plan. 52.219.9 is not applicable to small business concerns.

If the apparently successful offeror fails to negotiate a subcontracting plan acceptable to the Contracting Officer within the time limit prescribed by Contracting Officer, the apparently successful offeror will be ineligible for award.

3. EVALUATION OF PRICE (TAB 7).

Price will be subjectively evaluated by the Government considering:

(a) Best Value: The expected outcome of an acquisition, that, in the Government's estimation, provides the greatest overall benefit in response to the requirement.

(b) Realism: Costs in an offeror's proposal are realistic for the work to be performed, reflect a clear understanding of the requirements, and are consistent with the various elements of the offeror's technical proposal.

Note that all evaluation factors other than Price, when combined, are approximately equal to the Price evaluation.

4. COMPETITIVE RANGE.

Upon completion of proposal evaluation, the Government may determine a competitive range for the purpose of conducting written discussion. The competitive range shall be determined on the basis of the factors stated in the solicitation and shall include all proposal that have a reasonable chance of being selected for award. The Government intends to award a contract on the basis of initial offers received, without discussions. Therefore, each initial offer should contain the offeror's best terms from a cost or price and technical standpoint. Notwithstanding, the Government may conduct written or oral discussion with all responsible offerors who submit proposals within the competitive range. Offerors submitting proposals determined outside of the competitive range (lacking a reasonable chance of being selected for contract award) will be notified in writing at the earliest practicable time. In accordance with Federal Acquisition Regulation (FAR) 15.505 and 15.506, the offeror may request a preaward or postaward debriefing in writing to the Contracting Officer within three days, in accordance with clause: "SERVICE OF PROTEST", of Section 00100 INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS.

5. FINAL PROPOSAL REVISIONS.

If discussions are held, upon completion of discussions, the Government shall issue to all Offerors still within the competitive range a request for final proposal revisions. Following the evaluation of final proposal revisions, the Government will select the source whose final proposal revision is most advantageous, considering only the factors included in the solicitation.

SECTION 00600
REPRESENTATIONS, CERTIFICATIONS & OTHER STATEMENTS OF OFFERORS

INDEX

1. (FAR 52.203-2) CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985).
2. (FAR 52.203-11) CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (APR 1991).
3. (FAR 52.204-3) TAXPAYER IDENTIFICATION (OCT 1998).
4. (FAR 52.204-5) WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS)[MAY 1999]
5. (DFARS 252.204-7001) COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (AUG 1999).
6. (FAR 52.209-5) CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (APR 2001).
7. (DFARS 252.209-7001) DISCLOSURE OF OWNERSHIP OR CONTROL BY A FOREIGN GOVERNMENT THAT SUPPORTS TERRORISM (MAR 1998). [For Contracts exceeding \$100,000]
8. (DFARS 252.209-7003) COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (MAR 1998)
9. RESERVED
10. (FAR 52.219-1) SMALL BUSINESS PROGRAM REPRESENTATIONS (MAY 2001) ALTERNATE I (OCT 2000) ALTERNATE II (OCT 2000)
11. RESERVED
12. (FARS 52.219-19) SMALL BUSINESS CONCERN REPRESENTATION FOR THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (OCT 2000).
13. (FARS 52.219-21) SMALL BUSINESS SIZE REPRESENTATION FOR TARGETED INDUSTRY CATEGORIES UNDER THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (MAY 1999).
14. (FAR 52.222-21) CERTIFICATION OF NONSEGREGATED FACILITIES (FEB 1999).
15. (FAR 52.222-22) PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999).
16. (FAR 52.223-4) RECOVERED MATERIAL CERTIFICATION (OCT 1997).
17. (FAR 52.223-13) CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (OCT 2000)
17. [For Contracts over \$100,000]
18. (DFARS 252.225-7031) SECONDARY ARAB BOYCOTT OF ISRAEL (JUN 1992)
19. (DFAR 252.247-7022) REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992).
20. CONTRACTOR'S CERTIFICATION (Reference FAR 4.102) (Local Provision)

SECTION 00600
REPRESENTATIONS, CERTIFICATIONS & OTHER STATEMENTS OF OFFERORS

The bidder (offeror) makes the following certification and representations as a part of the proposal, shall check the appropriate boxes, fill in the appropriate information, and provide signatures on the attached "Solicitation Form" (00600) pages, and submit with Standard Form 1442 (Section 00010).

1. (FAR 52.203-2) CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985).

(a) The offeror certifies that -

(1) The prices in this offer have been arrived at independ-ently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to (i) those prices, (ii) the intention to submit an offer, or (iii) the methods or factors used to calculate the prices offered;

(2) the prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a Sealed Bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

(3) no attempt has been made or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

(b) Each signature on the offer is considered to be a certification by the signatory that the signatory -

(1) is the person in the offeror's organization responsible for determining the prices being offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above; or

(2)(i) has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above _____

_____ [insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization];

(ii) as an authorized agent, does certify that the principals named in subdivision (b)(2)(i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above; and

(iii) as an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above.

(c) If the offeror deletes or modifies subparagraph (a)(2) above, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

2. (FAR 52.203-11) CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (APR 1991)

(a) The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph (b) of this certification.

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief that on or after December 23, 1989, -

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement;

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, OMB standard form LLL, Disclosure of Lobbying Activities, to the Contracting Officer; and

(3) He or she will include the language of this certification in all subcontract awards at any tier and require that all recipients of subcontract awards in excess of \$100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than \$10,000, and not more than \$100,000, for each such failure.

3. (FAR 52.204-3) TAXPAYER IDENTIFICATION (OCT 1998).

(a) Definitions.

"Common parent," as used in this provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

"Taxpayer Identification Number (TIN)," as used in this provision, means the number required by the Internal Revenue Service (IRS) to be used by the offeror in reporting income tax and other returns. The TIN may be either a Social Security Number or an Employer Identification Number.

(b) All offerors must submit the information required in paragraphs (d) through (f) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the IRS. If the resulting contract is subject to the payment reporting requirements described in Federal Acquisition Regulation (FAR) 4.904, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(d) Taxpayer Identification Number (TIN).

[] TIN: _____.

☐ TIN has been applied for.

☐ TIN is not required because:

☐ Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

☐ Offeror is an agency or instrumentality of a foreign government;

☐ Offeror is an agency or instrumentality of the Federal Government.

(e) Type of organization.

☐ Sole proprietorship;

☐ Partnership;

☐ Corporate entity (not tax-exempt);

☐ Corporate entity (tax-exempt);

☐ Government entity (Federal, State, or local);

☐ Foreign government;

☐ International organization per 26 CFR 1.6049-4;

☐ Other _____.

(f) Common parent.

☐ Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this provision.

☐ Name and TIN of common parent:

Name _____

TIN _____

(End of provision)

4. (FAR 52.204-5) WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS)[MAY 1999]

(a) *Definition.* Women-owned business concern, as used in this provision, means a concern that is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(b) *Representation.* [Complete only if the offeror is a women-owned business concern and has not represented itself as a small business concern in paragraph (b)(1) of FAR 52.219-1, Small Business Program Representations, of this solicitation.] The offeror represents that it ☐ is a women-owned business concern.

(End of provision)

5. (DFARS 252.204-7001) COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (AUG 1999).

(a) The offeror is requested to enter its CAGE code on its offer in the block with its name and address. The CAGE code entered must be for that name and address. Enter "CAGE" before the number.

(b) If the Offeror does not have a CAGE code, it may ask the Contracting Officer to request one from the Defense Logistics Information Service (DLIS). The Contracting Officer will-

- (1) Ask the Contractor to complete section B of a DD Form 2051, Request for Assignment of a Commercial and Government Entity (CAGE) Code;
- (2) Complete section A and forward the form to DLIS; and
- (3) Notify the Contractor of its assigned CAGE code.

(c) Do not delay submission of the offer pending receipt of a CAGE code.

6. (FAR 52.209-5) CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (APR 2001).

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that—

(i) The Offeror and/or any of its Principals—

(A) Are ☐ are not ☐ presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have ☐ have not ☐, within the three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; **[This language stayed indefinitely. Please use paragraph (a)(1)(i)(D) below.]**

(C) Are ☐ are not ☐ presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in paragraph (a)(1)(i)(B) of this provision; and **[This language stayed indefinitely. Please use paragraph (a)(1)(i)(E) below.]**

(D) Have ☐ have not ☐, within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(E) Are ☐ are not ☐ presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in subdivision (a)(1)(i)(D) of this provision.

(ii)(A) **[This paragraph (a)(1)(ii) is stayed indefinitely.]** The offeror, aside from the offenses enumerated in paragraphs (a)(1)(i)(A), (B), and (C) of this provision, has ☐ has not ☐ within the past three years, relative to tax, labor and employment, environmental, antitrust, or consumer protection laws—

(1) Been convicted of a Federal or State felony (or has any Federal or State felony indictments currently pending against them); or

(2) Had a Federal court judgment in a civil case brought by the United States rendered against them; or

(3) Had an adverse decision by a Federal administrative law judge, board, or commission indicating a willful violation of law.

(B) If the offeror has responded affirmatively, the offeror shall provide additional

information if requested by the Contracting Officer; and

(iii) The Offeror has [] has not [], within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

This Certification Concerns a Matter Within the Jurisdiction of an Agency of the United States and the Making of a False, Fictitious, or Fraudulent Certification May Render the Maker Subject to Prosecution Under Section 1001, Title 18, United States Code.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

7. (End of Provision)(DFARS 252.209-7001) DISCLOSURE OF OWNERSHIP OR CONTROL BY A FOREIGN GOVERNMENT THAT SUPPORTS TERRORISM (MAR 1998). [For Contracts exceeding \$100,000]

(a) Definitions.

As used in this provision-

(1) "Government of a terrorist country" includes the state and the government of a terrorist country, as well as any political subdivision, agency, or instrumentality thereof.

(2) "Terrorist country" means a country determined by the Secretary of State, under section 6(j)(1)(A)) of the Export Administration Act of 1979 (50 U.S.C. App. 2405(j)(i)(A)), to be a country the government of which has repeatedly provided support for acts of international terrorism. As of the date of this provision, terrorist countries include: Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria.

(3) "Significant interest" means-

(i) Ownership of or beneficial interest in 5 percent or more of the firm's or subsidiary's securities. Beneficial interest includes holding 5 percent or more of any class of the firm's securities in "nominee shares," "street names," or some other method of holding securities that does not disclose the beneficial owner;

(ii) Holding a management position in the firm, such as a director or officer;

(iii) Ability to control or influence the election, appointment, or tenure of directors or officers in the firm;

(iv) Ownership of 10 percent or more of the assets of a firm such as equipment, buildings, real estate, or other tangible assets of the firm; or

(v) Holding 50 percent or more of the indebtedness of a firm.

(b) Prohibition on award. In accordance with 10 U.S.C. 2327, no contract may be awarded to a firm or a subsidiary of a firm if the government of a terrorist country has a significant interest in the firm or subsidiary [or, in the case of a subsidiary, the firm that owns the subsidiary], unless a waiver is granted by the Secretary of Defense.

(c) Disclosure.

The Offeror shall disclose any significant interest the government of each of the following countries has in the Offeror or a subsidiary of the Offeror. If the Offeror is a subsidiary, it shall also disclose any significant interest the government of a terrorist country has in any firm that owns or controls the subsidiary. The disclosure shall include--

- (1) Identification of each government holding a significant interest; and
- (2) A description of the significant interest held by each Government.

(End of provision)

8. (DFARS 252.209-7003) COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (MAR 1998)

By submission of its offer, the offeror represents that, if it is subject to the reporting requirements of 37 U.S.C. 4212(d) (i.e., the VETS-100 report required by Federal Acquisition Regulation clause 52.222-37, Employment Reports on Disabled Veterans and Veterans of the Vietnam Era), it has submitted the more recent report required by 37 U.S.C. 4212(d).

(End of provision)

9. RESERVED

10. (FAR 52.219-1) SMALL BUSINESS PROGRAM REPRESENTATIONS (MAY 2001) ALTERNATE I (OCT 2000) ALTERNATE II (OCT 2000)

(a) (1) The North American Industry Classification System (NAICS) code for this acquisition is _____ [insert NAICS code].

(2) The small business size standard is \$_____ (insert size standard).

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) Representations. (1) The offeror represents as part of its offer that it ☐ is, ☐ is not a small business concern.

(2) *[Complete only if offeror represented itself as a small business concern in paragraph (b)(1) of this provision.]* The offeror represents, for general statistical purposes, that it ☐ is, ☐ is not, a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) *[Complete only if offeror represented itself as a small business concern in paragraph (b)(1) of this provision.]* The offeror represents as part of its offer that it ☐ is, ☐ is not a women-owned small business concern.

(4) *[Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.]* The offeror represents as part of its offer that it ☐ is, ☐ is not a veteran-owned small business concern.

(5) *[Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (b)(4) of this provision.]* The offeror represents as part of its offer that it ☐ is, ☐ is not a service-disabled veteran-owned small business concern.

(6) *[Complete only if offeror represented itself as a small business concern in paragraph (b)(1) of this provision.]* The offeror represents, as part of its offer, that—

- (i) It [] is, [] is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal place of ownership, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR part 126; and
- (ii) It [] is, [] is not a joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. *[The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture: _____.]* Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(7) *[Complete if offeror represented itself as disadvantaged in paragraph (b)(2) of this provision].*

The offeror shall check the category in which its ownership falls:

____ Black American.

____ Hispanic American.

____ Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians).

____ Asian-Pacific American (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia (Kampuchea), Vietnam, Korea, The Philippines, U.S. Trust Territory of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru).

____ Subcontinent Asian (Asian-Indian) American (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal).

____ Individual/concern, other than one of the preceding.

(c) Definitions. As used in this provision—

“Service-disabled veteran-owned small business concern”—

(1) Means a small business concern—

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

“Small business concern” means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR part 121 and the size standard in paragraph (a) of this provision.

“Veteran-owned small business concern” means a small business concern—

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

“Women-owned small business concern” means a small business concern—

(1) That is at least 51 percent owned by one or more women; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) *Notice.* (1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small, small disadvantaged or women-owned small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to sections 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall-

(i) Be punished by imposition of fine, imprisonment, or both;

(ii) Be subject to administrative remedies, including suspension and debarment; and

(iii) Be ineligible for participation in programs conducted under the authority of the Act.

11. RESERVED

12. (FARS 52.219-19) SMALL BUSINESS CONCERN REPRESENTATION FOR THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (OCT 2000).

(a) *Definition.* "Emerging small business" as used in this solicitation, means a small business concern whose size is no greater than 50 percent of the numerical size standard applicable to the North American Industry Classification System (NAICS) code assigned to a contracting opportunity.

(b) (Complete only if Offeror has represented itself under the provision at FAR 52.219-1 as a small business concern under the size standards of this solicitation.) The Offeror [] is, [] is not an emerging small business.

(c) (Complete only if the Offeror is a small business or an emerging small business, indicating its size range.)

Offeror's number of employees for the past 12 months (check this column if size standard stated in solicitation is expressed in terms of number of employees) or Offeror's average annual gross revenue for the last 3 fiscal years (check this column if size standard stated in solicitation is expressed in terms of annual receipts). (Check one of the following.)

No. of Employees	Average Annual Gross Revenues
____ 50 or fewer	____ \$1 million or less
____ 51 - 100	____ \$1,000,001 - \$2 million
____ 101 - 250	____ \$2,000,001 - \$3.5 million
____ 251 - 500	____ \$3,500,001 - \$5 million
____ 501 - 750	____ \$5,000,001 - \$10 million
____ 751 - 1,000	____ \$10,000,001 - \$17 million
____ Over 1,000	____ Over \$17 million

13. (FARS 52.219-21) SMALL BUSINESS SIZE REPRESENTATION FOR TARGETED INDUSTRY CATEGORIES UNDER THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (MAY 1999).

[Complete only if the Offeror has represented itself under the provision at 52.219-1 as a small business concern under the size standards of this solicitation.]

Offeror's number of employees for the past 12 months *[check this column if size standard stated in solicitation is expressed in terms of number of employees]* or Offeror's average annual gross revenue for the last 3 fiscal years *[check this column if size standard in solicitation is expressed in terms of annual receipts]*. *[Check one of the following.]*

NO. OF EMPLOYEES	AVERAGE ANNUAL GROSS REVENUES
____ 50 or fewer	____ \$1 million or less
____ 51 - 100	____ \$1,000,001 - \$2 million
____ 101 - 250	____ \$2,000,001 - \$3.5 million
____ 251 - 500	____ \$3,500,001 - \$5 million
____ 501 - 750	____ \$5,000,001 - \$10 million
____ 751 - 1,000	____ \$10,000,001 - \$17 million
____ Over 1,000	____ Over \$17 million

14. (FAR 52.222-21) CERTIFICATION OF NONSEGREGATED FACILITIES (FEB 1999).

(a) "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

(b) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.
(End of clause)

15. (FAR 52.222-22) PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999).

(a) It [] has, [] has not participated in a previous contract or subcontract subject the Equal Opportunity clause of this solicitation;

(b) It [] has, [] has not filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

(End of provision)

16. (FAR 52.223-4) RECOVERED MATERIAL CERTIFICATION (OCT 1997).

As required by the Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6962(c)(3)(A)(i)), the offeror certifies, by signing this offer, that the percentage of recovered materials to be used in the performance of the contract will be at least the amount required by the applicable contract specifications.
(End of provision)

**17. (FAR 52.223-13) CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (OCT 2000)
[For Contracts over \$100,000]**

(a) Submission of this certification is a prerequisite for making or entering into this contract imposed by Executive Order 12969, August 8, 1995.

(b) By signing this offer, the offeror certifies that-

(1) As the owner or operator of a facilities that will be used in the performance of this contract that are subject to the filing and reporting requirements described in section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106), the offeror will file and continue to file, for such facilities for the life of the contract the Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of the EPCRA and section 6607 of PPA; or

(2) None of its owned or operated facilities to be used in the performance of this contract is subject the Form R filing and reporting requirements because each facility is exempt for at least one of the following reasons: (Check each block that is applicable.)

☐ (i) The facility does not manufacture, process or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C. 11023(c);

☐ (ii) The facility does not have 10 or more full-time employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C. 11023(b)(1)(A);

☐ (iii) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

☐ (iv) The facility does not fall within Standard Industrial Classification Code (SIC) major groups 20 through 39 or their corresponding North American Industry Classification System (NAICS) sectors 31 through 33; or

☐ (v) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, or any other territory or possession over which the United States has jurisdiction.

18. (DFARS 252.225-7031) SECONDARY ARAB BOYCOTT OF ISRAEL (JUN 1992)

(a) Definitions. As used in this clause--

(1) "Foreign person" means any person other than a United States person as defined in Section 16(2) of the Export Administration Act of 1979 (50 U.S.C. App. Sec 2415).

(2) "United States person" is defined in Section 16(2) of the Export Administration Act of 1979 and means any United States resident or national (other than an individual resident outside the United States and employed by other than a United States person), any domestic concern (including any permanent domestic establishment of any foreign concern), and any foreign subsidiary or affiliate (including any foreign establishment) of any domestic concern which is controlled in fact by such domestic concern, as determined under regulations of the President.

(b) Certification.

By submitting this offer, the Offeror, if a foreign person, company, company or entity, certifies that it--

(1) Does not comply with the Secondary Arab Boycott of Israel; and

(2) Is not taking or knowingly agreeing to take any action, with respect to the Secondary Boycott of Israel by Arab countries, which 50 U.S.C. App. Sec 2407(a) prohibits a United States person from taking.

(End of clause)

19. (DFAR 252.247-7022) REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992).

(a) The Offeror shall indicate by checking the appropriate blank in paragraph (b) of this provision whether transportation of supplies by sea is anticipated under the resultant contract. The term "supplies" is defined in the Transportation of Supplies by Sea clause of this solicitation.

(b) REPRESENTATION. The Offeror represents that it-

_____ Does anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

_____ Does not anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

(c) Any contract resulting from this solicitation will include the Transportation of Supplies by Sea Clause. If the Offeror represents that it will not use ocean transportation, the resulting contract will also include the Defense FAR Supplement clause at 252.247-7024, Notification of Transportation of Supplies by Sea.

20. CONTRACTOR'S CERTIFICATION (Reference FAR 4.102) (Local Provision)

Offerors are cautioned to note the "Contractor's Certification" included in this solicitation and to furnish the information required by paragraph (b), Partnerships, and paragraph (c), Corporations, as appropriate.

(a) **CONTRACT WITH INDIVIDUAL.** If the resultant contract is with an individual, it shall be signed by the individual in his own name. A contract with an individual doing business as a firm shall be signed by that individual and will ordinarily take the following form.

_____ (Signed)

An individual doing business as

(b) **CONTRACTS WITH PARTNERSHIPS.** If the resultant contract is with a partnership, it need be signed by only one partner PROVIDED the partner signing has the authority to legally bind the partnership. In addition, the following statement shall be completed:

_____ is a partnership composed of
(Firm Name)

(List All Partners)

(Indicate if any partner is limited in partnership authority)

(c) **CONTRACTS WITH CORPORATIONS.** If the resultant contract is with a corporation, it shall be executed in the corporation name, followed by the word "by" after which the person who has been authorized to execute the contract on behalf of the corporation shall sign his/her name, with the designation of his/her official capacity. In addition, the following certification shall be completed:

I, _____, certify that I am the _____ of the corporation named as Contractor herein, that _____ who signed this contract on behalf of the Contractor was then _____ of said corporation, that said contract was duly for and on behalf of said corporation by authority of the governing body and is within the scope of its corporate powers.

In witness whereof, I have hereunto affixed my signature this ____ day of _____, 19____.

(Signature, Printed Name, Title)

(d) **CONTRACT WITH JOINT VENTURES.** If the resultant contract is with a joint venture, each participant shall sign and in the manner indicated above for each type of participant. In addition, to assure a single point of contact for resolution of contractual matters and payments, the following certification shall be signed by each participant in the joint venture.

The parties hereto expressly understand and agree as follows:

(1) _____
(Name) (Title) (Company)

is the principal representative of the joint venture. As such, all communications regarding the administration of the contract and the performance of the work thereunder may be directed to him. In the absence of:

(Name) (Title) (Company as above)

(Name) (Title) (Company of Alternate)

is the alternate principle of the joint venture.

(2) Directions, approvals, required notices, and all other communications from the Government to the joint venture, including transmittal of payments by the Government, shall be directed to:

(Name) (Title) (Company)

principal representative of the joint venture.

(e) **SIGNATURE OF AGENTS.** If the resultant contract is signed by an agent, other than as stated above, the fact of the agency will be evidenced by a copy of the Power of Attorney.

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SECTION 00700

CONTRACT CLAUSES

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67. *FAR 52.227-4 PATENT INDEMNITY--CONSTRUCTION CONTRACTS (APR 1984)
68. DFARS 252.227-7022 GOVERNMENT RIGHTS (UNLIMITED) (MAR 1979)
69. DFARS 252.227-7023 DRAWINGS AND OTHER DATA TO BECOME PROPERTY OF GOVERNMENT (MAR 1979)
70. DFARS 252.227-7033 RIGHTS IN SHOP DRAWINGS (APR 1966)
71. *FAR 52.228-2 ADDITIONAL BOND SECURITY (OCT 1997)
72. *FAR 52.228-5 INSURANCE--WORK ON A GOVERNMENT INSTALLATION (JAN 1997) [For Contracts Exceeding \$100,000]
73. *FAR 52.228-11 PLEDGES OF ASSETS (FEB 1992)
74. *FAR 52.228-12 PROSPECTIVE SUBCONTRACTOR REQUESTS FOR BONDS(OCT 1995)
75. FAR 52.228-14 IRREVOCABLE LETTER OF CREDIT (DEC 1999)
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77. FAR 52.229-3 FEDERAL, STATE, AND LOCAL TAXES (JAN 1991) [For Contracts Exceeding \$100,000]
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79. FAR 52.230-1 COST ACCOUNTING STANDARDS NOTICES AND CERTIFICATION (JUNE 2000)
80. *FAR 52.230-2 COST ACCOUNTING STANDARDS (APR 1998)
81. *FAR 52.230-3 DISCLOSURE AND CONSISTENCY OF COST ACCOUNTING PRACTICES (APR 1998)
82. DFARS 252.231-7000 SUPPLEMENTAL COST PRINCIPLES (DEC 1991)
83. *FAR 52.232-5 PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (MAY 1997)
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85. *FAR 52.232-10 PAYMENTS UNDER FIXED-PRICE ARCHITECT-ENGINEER CONTRACTS (AUG 1987)
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88. *FAR 52.232-26 PROMPT PAYMENT FOR FIXED-PRICE ARCHITECT-ENGINEER CONTRACTS (MAY 2001)
89. *FAR 52.232-27 PROMPT PAY FOR CONSTRUCTION CONTRACTS (MAY 2001)
90. *FAR 52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER –CENTRAL CONTRACTOR REGISTRATION (MAY 1999)
91. DFARS 252.232-7004 DOD PROGRESS PAYMENT RATES (OCT 2001)
92. DFARS 252.232-7005 REIMBURSEMENT OF SUBCONTRACTOR ADVANCE PAYMENTS--DOD PILOT MENTOR-PROTEGE PROGRAM (SEP 2001)
93. *FAR 52.233-1 DISPUTES (DEC 1998)
94. *FAR 52.233-11 DISPUTES (DEC 1998) ALTERNATE I (DEC 1991)
95. *FAR 52.233-3 PROTEST AFTER AWARD (AUG 1996)
96. RESERVED.
97. FAR 52.236-2 DIFFERING SITE CONDITIONS (APR 1984)
98. *FAR 52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)
99. *FAR 52.236-5 MATERIAL AND WORKMANSHIP (APR 1984)
100. *FAR 52.236-6 SUPERINTENDENCE BY THE CONTRACTOR (APR 1984)
101. FAR 52.236-7 PERMITS AND RESPONSIBILITIES (NOV 1991)
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105. *FAR 52.236-11 USE AND POSSESSION PRIOR TO COMPLETION (APR 1984)
106. *FAR 52.236-12 CLEANING UP (APR 1984)
107. *FAR 52.236-13 ACCIDENT PREVENTION-ALTERNATE I (NOV 1991)
108. *FAR 52.236-14 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)
109. FAR 52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984)

110. *FAR 52.236-17 LAYOUT OF WORK (APR 1984)
111. FAR 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997)
112. *FAR 52.236-23 RESPONSIBILITY OF THE ARCHITECT-ENGINEER CONTRACTOR (APR 1984)
113. *FAR 52.236-24 WORK OVERSIGHT IN ARCHITECT-ENGINEER CONTRACTS (APR 1984)
114. *FAR 52.236-25 REQUIREMENTS FOR REGISTRATION OF DESIGNERS (APR 1984)
115. *FAR 52.236-26 PRECONSTRUCTION CONFERENCE (FEB 1995)
116. DFARS 252.236-7000 MODIFICATION OF PROPOSALS -PRICE BREAKDOWN (DEC 1991)
117. *FAR 52.242-13 BANKRUPTCY (JUL 1995)
118. *FAR 52.242-14 SUSPENSION OF WORK (APR 1984)
119. DFARS 252.242-7005 COST/SCHEDULE STATUS REPORT (MAR 1998)
120. *FAR 52.243-1 CHANGES--FIXED-PRICE (AUG 1987) ALTERNATE III (AUG 1984)
121. FAR 52.243-4 CHANGES (AUG 1987)
122. DFARS 252.243-7001 PRICING OF CONTRACT MODIFICATIONS (DEC 1991)
123. DFARS 252.243-7002 REQUESTS FOR EQUITABLE ADJUSTMENT (MAR 1998)
124. *FAR 52.244-2 SUBCONTRACTS (AUG 1998)
125. *FAR 52.244-4 SUBCONTRACTORS AND OUTSIDE ASSOCIATES AND CONSULTANTS (ARCHITECT-ENGINEER SERVICES) (AUG 1998)
126. FAR 52.244-6 SUBCONTRACTS FOR COMMERCIAL ITEMS (MAY 2001)
127. *FAR 52.245-2 GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS) (DEC 1989) [For Government Property over \$100,000]
128. *FAR 52.245-4 GOVERNMENT-FURNISHED PROPERTY (SHORT FORM) (APR 1984) [For Government Property \$100,000 or Less]
129. *FAR 52.246-12 INSPECTION OF CONSTRUCTION (AUG 1996)
130. *FAR 52.246-21 WARRANTY OF CONSTRUCTION (MAR 1994)
131. DFARS 252.247-7023 TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)
132. DFARS 252.247-7024 NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)
133. ~~DELETED FAR 52.248-3 VALUE ENGINEERING--CONSTRUCTION (FEB 2000) (ALTERNATE I (APR 1984))~~
134. *FAR 52.249-2 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) ALTERNATE I (SEP 1996) [For Contracts Over \$100,000]
135. *FAR 52.249-10 DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984)
136. ENVIRONMENTAL LITIGATION (1974 NOV OCE)
137. EFARS 52.249-5000 BASIS FOR SETTLEMENT OF PROPOSALS

SECTION 00700

CONTRACT CLAUSES

1. FAR 52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://www.arnet.gov/far>

(End of clause)

* - CONTRACT CLAUSES THAT MAY BE INCORPORATED BY REFERENCE

2. DFARS 252.201-7000 CONTRACTING OFFICER'S REPRESENTATIVE (DEC 1991)

(a) Definition.

"Contracting officer's representative" means an individual designated in accordance with subsection 201.602-2 of the Defense Federal Acquisition Regulation Supplement and authorized in writing by the contracting officer to perform specific technical or administrative functions.

(b) If the Contracting Officer designates a contracting officer's representative (COR), the Contractor will receive a copy of the written designation. It will specify the extent of the COR's authority to act on behalf of the contracting officer. The COR is not authorized to make any commitments or changes that will affect price, quality, quantity, delivery, or any other term or condition of the contract.

(End of clause)

3. *FAR 52.202-1 DEFINITIONS (DEC 2001) ALTERNATE I (MAR 2001)

a) "Agency head" or "head of the agency" means the Secretary (Attorney General, Administrator, Governor, Chairperson, or other chief official, as appropriate) of the agency, unless otherwise indicated, including any deputy or assistant chief official of the executive agency.

(b) "Commercial component" means any component that is a commercial item.

(c) "Commercial item" means—

(1) Any item, other than real property, that is of a type customarily used by the general public or by non-governmental entities for purposes other than governmental purposes, and that—

(i) Has been sold, leased, or licensed to the general public; or

(ii) Has been offered for sale, lease, or license to the general public;

(2) Any item that evolved from an item described in paragraph (c)(1) of this clause through advances in technology or performance and that is not yet available in the commercial marketplace, but will be available in the commercial marketplace in time to satisfy the delivery requirements under a Government solicitation;

(3) Any item that would satisfy a criterion expressed in paragraphs (c)(1) or (c)(2) of this clause, but for—

(i) Modifications of a type customarily available in the commercial marketplace; or

(ii) Minor modifications of a type not customarily available in the commercial

marketplace made to meet Federal Government requirements. "Minor" modifications means modifications that do not significantly alter the nongovernmental function or essential physical characteristics of an item or component, or change the purpose of a process. Factors to be considered in determining whether a modification is minor include the value and size of the modification and the comparative value and size of the final product. Dollar values and percentages may be used as guideposts, but are not conclusive evidence that a modification is minor;

(4) Any combination of items meeting the requirements of paragraphs (c)(1), (2), (3), or (5) of this clause that are of a type customarily combined and sold in combination to the general public;

(5) Installation services, maintenance services, repair services, training services, and other services if—

(i) Such services are procured for support of an item referred to in paragraph (c)(1), (2), (3), or (4) of this definition, regardless of whether such services are provided by the same source or at the same time as the item; and

(ii) The source of such services provides similar services contemporaneously to the general public under terms and conditions similar to those offered to the Federal Government

(6) Services of a type offered and sold competitively in substantial quantities in the commercial marketplace based on established catalog or market prices for specific tasks performed under standard commercial terms and conditions. This does not include services that are sold based on hourly rates without an established catalog or market price for a specific service performed. For purposes of these services—

(i) "Catalog price" means a price included in a catalog, price list, schedule, or other form that is regularly maintained by the manufacturer or vendor, is either published or otherwise available for inspection by customers, and states prices at which sales are currently, or were last, made to a significant number of buyers constituting the general public; and

(ii) "Market prices" means current prices that are established in the course of ordinary trade between buyers and sellers free to bargain and that can be substantiated through competition or from sources independent of the offerors.

(7) Any item, combination of items, or service referred to in paragraphs (c)(1) through (c)(6), notwithstanding the fact that the item, combination of items, or service is transferred between or among separate divisions, subsidiaries, or affiliates of a Contractor; or

(8) A nondevelopmental item, if the procuring agency determines the item was developed exclusively at private expense and sold in substantial quantities, on a competitive basis, to multiple State and local Governments.

(d) "Component" means any item supplied to the Government as part of an end item or of another component, except that for use in 52.225-9, and 52.225-11 see the definitions in 52.225-9(a) and 52.225-11(a).

(e) "Contracting Officer" means a person with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the Contracting Officer acting within the limits of their authority as delegated by the Contracting Officer.

(f) "Nondevelopmental item" means—

(1) Any previously developed item of supply used exclusively for governmental purposes by a Federal agency, a State or local government, or a foreign government with which the United States has a mutual defense cooperation agreement;

(2) Any item described in paragraph (f)(1) of this definition that requires only minor modification or modifications of a type customarily available in the commercial marketplace in order to meet the requirements of the procuring department or agency; or

(3) Any item of supply being produced that does not meet the requirements of paragraph (f)(1) or (f)(2) solely because the item is not yet in use.

(End of clause)

4. *FAR 52.203-3 GRATUITIES (APR 1984)

(a) The right of the Contractor to proceed may be terminated by written notice if, after notice and hearing, the agency head or a designee determines that the Contractor, its agent, or another representative--

(1) Offered or gave a gratuity (e.g., an entertainment or gift) to an officer, official, or employee of the Government; and

- (2) Intended, by the gratuity, to obtain a contract or favorable treatment under a contract.
- (b) The facts supporting this determination may be reviewed by any court having lawful jurisdiction.
- (c) If this contract is terminated under paragraph (a) above, the Government is entitled--
 - (1) To pursue the same remedies as in a breach of the contract; and
 - (2) In addition to any other damages provided by law, to exemplary damages of not less than 3 nor more than 10 times the cost incurred by the Contractor in giving gratuities to the person concerned, as determined by the agency head or a designee. (This subparagraph (c)(2) is applicable only if this contract uses money appropriated to the Department of Defense.)
- (d) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

5. *FAR 52.203-5 COVENANT AGAINST CONTINGENT FEES (APR 1984)

(a) The Contractor warrants that no person or agency has been employed or retained to solicit or obtain this contract upon an agreement or understanding for a contingent fee, except a bona fide employee or agency. For breach or violation of this warranty, the Government shall have the right to annul this contract without liability or, in its discretion, to deduct from the contract price or consideration, or otherwise recover, the full amount of the contingent fee.

(b) "Bona fide agency," as used in this clause, means an established commercial or selling agency, maintained by a contractor for the purpose of securing business, that neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds itself out as being able to obtain any Government contract or contracts through improper influence.

"Bona fide employee," as used in this clause, means a person, employed by a contractor and subject to the contractor's supervision and control as to time, place, and manner of performance, who neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds out as being able to obtain any Government contract or contracts through improper influence.

"Contingent fee," as used in this clause, means any commission, percentage, brokerage, or other fee that is contingent upon the success that a person or concern has in securing a Government contract.

"Improper influence," as used in this clause, means any influence that induces or tends to induce a Government employee or officer to give consideration or to act regarding a Government contract on any basis other than the merits of the matter.

6. *FAR 52.203-7 ANTI-KICKBACK PROCEDURES (JUL 1995)

(a) Definitions.

"Kickback," as used in this clause, means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided, directly or indirectly, to any prime Contractor, prime Contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a subcontract relating to a prime contract. "Person," as used in this clause, means a corporation, partnership, business association of any kind, trust, joint-stock company, or individual.

"Prime contract," as used in this clause, means a contract or contractual action entered into by the United States for the purpose of obtaining supplies, materials, equipment, or services of any kind.

"Prime Contractor," as used in this clause, means a person who has entered into a prime contract with the United States.

"Prime Contractor employee," as used in this clause, means any officer, partner, employee, or agent of a prime Contractor.

"Subcontract," as used in this clause, means a contract or contractual action entered into by a prime Contractor or subcontractor for the purpose of obtaining supplies, materials, equipment, or services of any kind under a prime contract.

"Subcontractor," as used in this clause, (1) means any person, other than the prime Contractor, who offers to furnish or furnishes any supplies, materials, equipment, or services of any kind under a prime contract or a subcontract entered into in connection with such prime contract, and (2) includes any person who offers to furnish or furnishes general supplies to the prime Contractor or a higher tier subcontractor.

"Subcontractor employee," as used in this clause, means any officer, partner, employee, or agent of a subcontractor.

- (b) The Anti-Kickback Act of 1986 (41 U.S.C. 51-58) (the Act), prohibits any person from--
 - (1) Providing or attempting to provide or offering to provide any kickback;
 - (2) Soliciting, accepting, or attempting to accept any kickback; or
 - (3) Including, directly or indirectly, the amount of any kickback in the contract price charged by a prime Contractor to the United States or in the contract price charged by a subcontractor to a prime Contractor or higher tier subcontractor.
- (c) (1) The Contractor shall have in place and follow reasonable procedures designed to prevent and detect possible violations described in paragraph (b) of this clause in its own operations and direct business relationships.
 - (2) When the Contractor has reasonable grounds to believe that a violation described in paragraph (b) of this clause may have occurred, the Contractor shall promptly report in writing the possible violation. Such reports shall be made to the inspector general of the contracting agency, the head of the contracting agency if the agency does not have an inspector general, or the Department of Justice.
 - (3) The Contractor shall cooperate fully with any Federal agency investigating a possible violation described in paragraph (b) of this clause.
 - (4) The Contracting Officer may
 - (i) offset the amount of the kickback against any monies owed by the United States under the prime contract and/or
 - (ii) direct that the Prime Contractor withhold from sums owed a subcontractor under the prime contract the amount of the kickback. The Contracting Officer may order that monies withheld under subdivision (c)(4)(ii) of this clause be paid over to the Government unless the Government has already offset those monies under subdivision (c)(4)(i) of this clause. In either case, the Prime Contractor shall notify the Contracting Officer when the monies are withheld.
 - (5) The Contractor agrees to incorporate the substance of this clause, including subparagraph (c)(5) but excepting subparagraph (c)(1), in all subcontracts under this contract which exceed \$100,000.

7. *FAR 52.203-8 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

- (a) If the Government receives information that a contractor or a person has engaged in conduct constituting a violation of subsection (a), (b), (c), or (d) of Section 27 of the Office of Federal Procurement Policy Act (41 U.S.C. 423) (the Act), as amended by section 4304 of the National Defense Authorization Act for Fiscal Year 1996 (Pub. L. 104-106), the Government may--
 - (1) Cancel the solicitation, if the contract has not yet been awarded or issued; or
 - (2) Rescind the contract with respect to which--
 - (i) The Contractor or someone acting for the Contractor has been convicted for an offense where the conduct constitutes a violation of subsection 27 (a) or (b) of the Act for the purpose of either--
 - (A) Exchanging the information covered by such subsections for anything of value; or
 - (B) Obtaining or giving anyone a competitive advantage in the award of a Federal agency procurement contract; or
 - (ii) The head of the contracting activity has determined, based upon a preponderance of the evidence, that the Contractor or someone acting for the Contractor has engaged in conduct constituting an offense punishable under subsection 27(e)(1) of the Act.
- (b) If the Government rescinds the contract under paragraph (a) of this clause, the Government is entitled to recover, in addition to any penalty prescribed by law, the amount expended under the contract.
- (c) The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law, regulation, or under this contract.

8. DFARS 252.203-7001 PROHIBITION ON PERSONS CONVICTED OF FRAUD OR OTHER DEFENSE—CONTRACT-RELATED FELONIES (MARCH 1999)

- (a) Definitions.
As used in this clause--
 - (1) "Arising out of a contract with the "DoD" means any any act in connection with--
 - (i) Attempting to obtain;
 - (ii) Obtaining; or
 - (iii) Performing a contract or first-tier subcontract of any department, or component of the Department of Defense (DoD).
 - (2) "Conviction of fraud or any other felony," means any conviction for fraud or a felony in violation of state or Federal criminal statutes, whether entered on a verdict or plea, including a plea of nolo contendere, for which sentence has been imposed.
 - (3) "Date of conviction," means the date judgement was entered against the individual.
- (b) Any individual who is convicted after September 29, 1988 of fraud or any other felony arising out of a contract with the DoD is prohibited from serving--
 - (1) In a management or supervisory capacity on any DoD contract or first-tier subcontract;
 - (2) On board of directors of any DoD Contractor or first-tier subcontractor;
 - (3) As a consultant to any DoD Contractor or first-tier subcontractor; or
 - (4) In any other capacity with the authority to influence, advise, or control the decisions of any DoD contractor or subcontractor with regard to any DoD contract or first-tier subcontract.
- (c) Unless waived, the prohibition in paragraph (b) of this clause applies for not less than five years from the date of conviction.
- (d) 10 U.S.C. 2408 provides that a defense Contractor or first-tier subcontractor shall be subject to a criminal penalty of not more than \$500,000 if convicted of knowingly--
 - (1) Employing a person under a prohibition in paragraph (b) of this clause ;
 - (2) Allowing such a person to serve on the board of directors of Contractor or first-tier subcontractor.
- (e) In addition to the criminal penalties contained in 10 U.S.C. 2408, the Government may consider other available remedies, such as--
 - (1) Suspension or debarment;
 - (2) Cancellation of the contract at no cost to the Government; or
 - (3) Termination of the contract for default.
- (f) The Contractor may submit written requests for waiver of the prohibition in paragraph (b) of this clause to the Contracting Officer. Requests shall clearly identify--
 - (1) The person involved;
 - (2) The nature of the conviction and resultant sentence or punishment imposed ;
 - (3) The reasons for the requested waiver; and
 - (4) An explanation of why a waiver is in the interest of national security.
- (g) The Contractor agrees to include the substance of this clause appropriately modified to reflect the identity and relationship of the parties, in all first-tier subcontracts exceeding the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation, except those for commercial items or components.
- (h) Pursuant to 10 U.S.C.2408(c), defense contractors and subcontractors may obtain information as to whether a particular has been convicted of fraud or any other felony arising out of a contract with the DoD by contracting The Office of Justice Programs, The Denial of Federal Benefits Office, U.S. Department of Justice, telephone (202) 616-3507.

9. RESERVED

**10. *FAR 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY
(JAN 1997)**

(a) The Government, at its election, may reduce the price of a fixed-price type contract and the total cost and fee under a cost-type contract of profit or fee determined as set forth in paragraph (b) of this clause if the head of the contracting activity or designee determines that there was a violation of subsection 27(a), (b), or (c) of the Office of Federal Procurement Policy Act, as amended (41 U.S.C. 423), as implemented in section 3.104 of the Federal Acquisition Regulation.

(b) The price or fee reduction referred to in paragraph (a) of this clause shall be--

(1) For cost-plus-fixed-fee contracts, the amount of the fee specified in the contract at the time of award;

(2) For cost-plus-incentive-fee contracts, the target fee specified in the contract at the time of award, notwithstanding any minimum fee or "fee floor" specified in the contract;

(3) For cost-plus-award-fee contracts--

(i) The base fee established in the contract at the time of contract award;

(ii) If no base fee is specified in the contract, 30 percent of the amount of each award fee otherwise payable to the Contractor for each award fee evaluation period or at each award fee determination point.

(4) For fixed-price-incentive contracts, the Government may--

(i) Reduce the contract target price and contract target profit both by an amount equal to the initial target profit specified in the contract at the time of contract award; or

(ii) If an immediate adjustment to the contract target price and contract target profit would have a significant adverse impact on the incentive price revision relationship under the contract, or adversely affect the contract financing provisions, the Contracting Officer may defer such adjustment until establishment of the total final price of the contract. The total final price established in accordance with the incentive price revision provisions of the contract shall be reduced by an amount equal to the initial target profit specified in the contract at the time of contract award and such reduced price shall be the total final contract price.

(5) For firm-fixed-price contracts, by 10 percent of the initial contract price or a profit amount determined by the Contracting Officer from records or documents in existence prior to the date of the contract award.

(c) The Government may, at its election, reduce a prime contractor's price or fee in accordance with the procedures of paragraph (b) of this clause for violations of the Act by its subcontractors by an amount not to exceed the amount of profit or fee reflected in the subcontract at the time the subcontract was first definitively priced.

(d) In addition to the remedies in paragraphs (a) and (c) of this clause, the Government may terminate this contract for default. The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law or under this contract.

**11. *FAR 52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL
TRANSACTIONS (JUN 1997)**

(a) Definitions.

"Agency," as used in this clause, means executive agency as defined in 2.101.

"Covered Federal Action," as used in this clause, means any of the following Federal actions:

(1) The awarding of any Federal contract.

(2) The making of any Federal grant.

(3) The making of any Federal loan.

(4) The entering into of any cooperative agreement.

(5) The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

"Indian tribe" and "tribal organization," as used in this clause, have the meaning provided in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450B) and include Alaskan Natives.

"Influencing or attempting to influence," as used in this clause, means making, with the intent to influence, any communication to or appearance before an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal action.

"Local government," as used in this clause, means a unit of government in a State and, if chartered, established, or otherwise recognized by a State for the performance of a governmental duty, including a local public authority, a special district, an intrastate district, a council of governments, a sponsor group representative organization, and any other instrumentality of a local government.

"Officer or employee of an agency," as used in this clause, includes the following individuals who are employed by an agency:

(1) An individual who is appointed to a position in the Government under title 5, United States Code, including a position under a temporary appointment.

(2) A member of the uniformed services, as defined in subsection 101(3), title 37, United States Code.

(3) A special Government employee, as defined in section 202, title 18, United States Code.

(4) An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, title 5, United States Code, appendix 2.

"Person," as used in this clause, means an individual, corporation, company, association, authority, firm, partnership, society, State and local government, regardless of whether such entity is operated for profit, or not for profit. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Reasonable compensation," as used in this clause, means, with respect to a regularly employed officer or employee of any person, compensation that is consistent with the normal compensation for such officer or employee for work that is not furnished to, not funded by, or not furnished in cooperation with the Federal Government.

"Reasonable payment," as used in this clause, means, with respect to professional and other technical services, a payment in an amount that is consistent with the amount normally paid for such services in the private sector.

"Recipient," as used in this clause, includes the Contractor and all subcontractors. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Regularly employed," as used in this clause, means, with respect to an officer or employee of a person requesting or receiving a Federal contract, an officer or employee who is employed by such person for at least 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person for receipt of such contract. An officer or employee who is employed by such person for less than 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person shall be considered to be regularly employed as soon as he or she is employed by such person for 130 working days.

"State," as used in this clause, means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, a territory or possession of the United States, an agency or instrumentality of a State, and multi-State, regional, or interstate entity having governmental duties and powers.

(b) Prohibitions.

(1) Section 1352 of title 31, United States Code, among other things, prohibits a recipient of a Federal Contract, grant, loan, or cooperative agreement from using appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: The awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.

(2) The Act also requires Contractors to furnish a disclosure if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

(3) The prohibitions of the Act do not apply under the following conditions:

(i) Agency and legislative liaison by own employees.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of a payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action if the payment is for agency and legislative liaison activities not directly related to a covered Federal action.

(B) For purposes of subdivision (b)(3)(i)(A) of this clause, providing any information specifically requested by an agency or Congress is permitted at any time.

(C) The following agency and legislative liaison activities are permitted at any time where they are not related to a specific solicitation for any covered Federal action:

(1) Discussing with an agency the qualities and characteristics (including individual demonstrations) of the person's products or services, conditions or terms of sale, and service capabilities.

(2) Technical discussions and other activities regarding the application or adaptation of the person's products or services for an agency's use.

(D) The following agency and legislative liaison activities are permitted where they are prior to formal solicitation of any covered Federal action--

(1) Providing any information not specifically requested but necessary for an agency to make an informed decision about initiation of a covered Federal action;

(2) Technical discussions regarding the preparation of an unsolicited proposal prior to its official submission; and

(3) Capability presentations by persons seeking awards from an agency pursuant to the provisions of the Small Business Act, as amended by Pub. L. 95-507, and subsequent amendments.

(E) Only those services expressly authorized by subdivision (b)(3)(i)(A) of this clause are permitted under this clause.

(ii) Professional and technical services.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of--

(1) A payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action, if payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action.

(2) Any reasonable payment to a person, other than an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action if the payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action. Persons other than officers or employees of a person requesting or receiving a covered Federal action include consultants and trade associations.

(B) For purposes of subdivision (b)(3)(ii)(A) of this clause, "professional and technical services" shall be limited to advice and analysis directly applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or proposal by a lawyer is allowable. Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer) or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise and unless the advice or analysis is rendered directly and solely in the preparation, submission or negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer is not providing professional legal services. Similarly, communications with the intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not

allowable under this section since the engineer is providing technical services but not directly in the preparation, submission or negotiation of a covered Federal action.

(C) Requirements imposed by or pursuant to law as a condition for receiving a covered Federal award include those required by law or regulation and any other requirements in the actual award documents.

(D) Only those services expressly authorized by subdivisions (b)(3)(ii)(A)(1) and (2) of this clause are permitted under this clause.

(E) The reporting requirements of FAR 3.803(a) shall not apply with respect to payments of reasonable compensation made to regularly employed officers or employees of a person.

(iii) Disclosure.

(A) The Contractor who requests or receives from an agency a Federal contract shall file with that agency a disclosure form, OMB standard form LLL, Disclosure of Lobbying Activities, if such person has made or has agreed to make any payment using nonappropriated funds (to include profits from any covered Federal action), which would be prohibited under subparagraph (b)(1) of this clause, if paid for with appropriated funds.

(B) The Contractor shall file a disclosure form at the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under subparagraph (c)(1) of this clause. An event that materially affects the accuracy of the information reported includes--

(1) A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or

(2) A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or

(3) A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

(C) The Contractor shall require the submittal of a certification, and if required, a disclosure form by any person who requests or receives any subcontract exceeding \$100,000 under the Federal contract.

(D) All subcontractor disclosure forms (but not certifications) shall be forwarded from tier to tier until received by the prime Contractor. The prime Contractor shall submit all disclosures to the Contracting Officer at the end of the calendar quarter in which the disclosure form is submitted by the subcontractor. Each subcontractor certification shall be retained in the subcontract file of the awarding Contractor.

(iv) Agreement. The Contractor agrees not to make any payment prohibited by this clause.

(v) Penalties.

(A) Any person who makes an expenditure prohibited under paragraph (a) of this clause or who fails to file or amend the disclosure form to be filed or amended by paragraph (b) of this clause shall be subject to civil penalties as provided for by 31 U.S.C. 1352. An imposition of a civil penalty does not prevent the Government from seeking any other remedy that may be applicable.

(B) Contractors may rely without liability on the representation made by their subcontractors in the certification and disclosure form.

(vi) Cost allowability. Nothing in this clause makes allowable or reasonable any costs which would otherwise be unallowable or unreasonable. Conversely, costs made specifically unallowable by the requirements in this clause will not be made allowable under any other provision.

12. DFARS 252.203-7002 DISPLAY OF DOD HOTLINE POSTER (DEC 1991) **(For Military Contracts Exceeding \$5,000,000)**

(a) The Contractor shall display prominently in common work areas within business segments performing work under Department of Defense (DoD) contracts, DoD Hotline Posters prepared by DoD Office of the Inspector General.

(b) DoD Hotline Posters may be obtained from the DoD Inspector General, ATTN: Defense Hotline, 400 Army Navy Drive, Washington DC 22202-2884.

(c) The Contract need not comply with paragraph (a) of this clause if it has established a mechanism, such as a hotline, by which employees may report suspected instances of improper conduct, and instructions that encourage employees to make such reports.

13. *FAR 52.204-4 PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER (AUG 2000)

(a) Definitions. As used in this clause—

“Postconsumer material” means a material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. Postconsumer material is a part of the broader category of “recovered material.” For paper and paper products, postconsumer material means “postconsumer fiber” defined by the U.S. Environmental Protection Agency (EPA) as—

(1) Paper, paperboard, and fibrous materials from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; or

(2) All paper, paperboard, and fibrous materials that enter and are collected from municipal solid waste; but not

(3) Fiber derived from printers' over-runs, converters' scrap, and over-issue publications.

“Printed or copied double-sided” means printing or reproducing a document so that information is on both sides of a sheet of paper.

“Recovered material,” for paper and paper products, is defined by EPA in its Comprehensive Procurement Guideline as “recovered fiber” and means the following materials:

(1) Postconsumer fiber; and

(2) Manufacturing wastes such as—

(i) Dry paper and paperboard waste generated after completion of the papermaking process (that is, those manufacturing operations up to and including the cutting and trimming of the paper machine reel into smaller rolls or rough sheets) including: envelope cuttings, bindery trimmings, and other paper and paperboard waste resulting from printing, cutting, forming, and other converting operations; bag, box, and carton manufacturing wastes; and butt rolls, mill wrappers, and rejected unused stock; and

(ii) Repulped finished paper and paperboard from obsolete inventories of paper and paperboard manufacturers, merchants, wholesalers, dealers, printers, converters, or others.

(b) In accordance with Section 101 of Executive Order 13101 of September 14, 1998, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition, the Contractor is encouraged to submit paper documents, such as offers, letters, or reports, that are printed or copied double-sided on recycled paper that meet minimum content standards specified in Section 505 of Executive Order 13101, when not using electronic commerce methods to submit information or data to the Government.

(c) If the Contractor cannot purchase high-speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, white wove envelopes, writing and office paper, book paper, cotton fiber paper, and cover stock meeting the 30 percent postconsumer material standard for use in submitting paper documents to the Government, it should use paper containing no less than 20 percent postconsumer material. This lesser standard should be used only when paper meeting the 30 percent postconsumer material standard is not obtainable at a reasonable price or does not meet reasonable performance standards.

(End of clause)

14. DFARS 252.204-7003 CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT (APR 1992)

The Contractor's procedures for protecting against unauthorized disclosure of information shall not require Department of Defense employees or members of the Armed Forces to relinquish control of their work products, whether classified or not, to the Contractor.

15. *FAR 52.209-6 PROTECTING THE GOVERNMENTS INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUL 1995)

(a) The Government suspends or debar Contractors to protect the Government's interests. The Contractor shall not enter into any subcontract in excess of \$25,000 with a Contractor that is debarred, suspended, or proposed for debarment unless there is a compelling reason to do so.

(b) The Contractor shall require each proposed first-tier subcontractor, whose subcontract will exceed \$25,000, to disclose to the Contractor, in writing, whether as of the time of award of the subcontract, the subcontractor, or its principals, is or is not debarred, suspended, or proposed for debarment by the Federal Government.

(c) A corporate office or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is debarred, suspended, or proposed for debarment (see FAR 9.404 for information on the List of Parties Excluded from Procurement Programs). The notice must include the following:

- (1) The name of the subcontractor.
- (2) The Contractor's knowledge of the reasons for the subcontractor being on the List of Parties Excluded from Procurement Programs.
- (3) The compelling reason(s) for doing business with the subcontractor notwithstanding its inclusion on the List of Parties Excluded From Procurement Programs.
- (4) The systems and procedures the Contractor has established to ensure that it is fully protecting the Government's interests when dealing with such subcontractor in view of the specific basis for the party's debarment, suspension, or proposed debarment.

16. DFARS 252.209-7004 SUBCONTRACTING WITH FIRMS THAT ARE OWNED OR CONTROLLED BY THE GOVERNMENT OF A TERRORIST COUNTRY (MAR 1998)

(a) Unless the Government determines that there is a compelling reason to do so, the Contractor shall not enter into any subcontract in excess of \$25,000 with a firm, or a subsidiary of a firm, that is identified, on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs, as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a terrorist country.

(b) A corporate officer or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is identified, on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs, as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a terrorist country. The notice must include the name of the proposed subcontractor and the compelling reason(s) for doing business with the subcontractor notwithstanding its inclusion on the List of Parties Excluded From Federal Procurement and Nonprocurement Programs.

(End of clause)

17. *FAR 52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (SEP 1990) [For Military Contract's Only]

This is a rated order certified for national defense use, and the Contractor shall follow all the requirements of the Defense Priorities and Allocations System regulation (15 CFR 700).

18. ~~DELETED FAR 52.211-18~~ VARIATION IN ESTIMATED QUANTITY (APR 1984)

~~If the quantity of a unit priced item in this contract is an estimated quantity and the actual quantity of the unit priced item varies more than 15 percent above or below the estimated quantity, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above 115 percent or below 85 percent of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contractor may request, in writing, an extension of time, to be received by the Contracting Officer within 10 days from the beginning of the delay, or within such further period as may be granted by the Contracting Officer before the date of final settlement of the contract. Upon the receipt of a written request for an extension, the Contracting Officer shall ascertain the facts and make an adjustment for extending the completion date as, in the judgement of the Contracting Officer, is justified.~~

19. *FAR 52.215-2 AUDIT AND RECORDS-NEGOTIATION (JUNE 1999)

(a) As used in this clause, "records" includes books, documents, accounting procedures and practices, and other data, regardless of type and regardless of whether such items are in written form, in the form of computer data, or in any other form.

(b) Examination of costs. If this is a cost-reimbursement, incentive, time-and-materials, labor-hour, or price redeterminable contract, or any combination of these, the Contractor shall maintain and the Contracting Officer, or an authorized representative of the Contracting Officer, shall have the right to examine and audit all records and other evidence sufficient to reflect properly all costs claimed to have been incurred or anticipated to be incurred directly or indirectly in performance of this contract. This right of examination shall include inspection at all reasonable times of the Contractor's plants, or parts of them, engaged in performing the contract.

(c) Cost or pricing data. If the Contractor has been required to submit cost or pricing data in connection with any pricing action relating to this contract, the Contracting Officer, or an authorized representative of the Contracting Officer, in order to evaluate the accuracy, completeness, and currency of the cost or pricing data, shall have the right to examine and audit all of the Contractor's records, including computations and projections, related to--

- (1) The proposal for the contract, subcontract, or modification;
- (2) The discussions conducted on the proposal(s), including those related to negotiating;
- (3) Pricing of the contract, subcontract, or modification; or
- (4) Performance of the contract, subcontract or modification.

(d) Comptroller General--(1) The Comptroller General of the United States, or an authorized representative, shall have access to and the right to examine any of the Contractor's directly pertinent records involving transactions related to this contract or a subcontract hereunder.

(2) This paragraph may not be construed to require the Contractor or subcontractor to create or maintain any record that the Contractor or subcontractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e) Reports. If the Contractor is required to furnish cost, funding, or performance reports, the Contracting Officer or an authorized representative of the Contracting Officer shall have the right to examine and audit the supporting records and materials, for the purpose of evaluating--

(1) The effectiveness of the Contractor's policies and procedures to produce data compatible with the objectives of these reports; and

(2) The data reported.

(f) Availability. The Contractor shall make available at its office at all reasonable times the records, materials, and other evidence described in paragraphs (a), (b), (c), (d), and (e) of this clause, for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in Subpart 4.7, Contractor Records Retention, of the Federal Acquisition Regulation (FAR), or for any longer period required by statute or by other clauses of this contract. In addition--

(1) If this contract is completely or partially terminated, the Contractor shall make available the records relating to the work terminated until 3 years after any resulting final termination settlement; and

(2) The Contractor shall make available records relating to appeals under the Disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.

(g) The Contractor shall insert a clause containing all the terms of this clause, including this paragraph (g), in all subcontracts under this contract that exceed the simplified acquisition threshold, and--

(1) That are cost-reimbursement, incentive, time-and-materials, labor-hour, or price- redeterminable type or any combination of these;

(2) For which cost or pricing data are required; or

(3) That require the subcontractor to furnish reports as discussed in paragraph (e) of this clause.

The clause may be altered only as necessary to identify properly the contracting parties and the Contracting Officer under the Government prime contract.

(End of clause)

20. *FAR 52.215-10 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA (OCT 1997)

(a) If any price, including profit or fee, negotiated in connection with this contract, or any cost reimbursable under this contract, was increased by any significant amount because--

(1) The Contractor or a subcontractor furnished cost or pricing data that were not complete, accurate, and current as certified in its Certificate of Current Cost or Pricing Data;

(2) A subcontractor or prospective subcontractor furnished the Contractor cost or pricing data that were not complete, accurate, and current as certified in the Contractor's Certificate of Current Cost or Pricing Data; or

(3) Any of these parties furnished data of any description that were not accurate, the price or cost shall be reduced accordingly and the contract shall be modified to reflect the reduction.

(b) Any reduction in the contract price under paragraph (a) of this clause due to defective data from a prospective subcontractor that was not subsequently awarded the subcontract shall be limited to the amount, plus applicable overhead and profit markup, by which--

(1) The actual subcontract; or

(2) The actual cost to the Contractor, if there was no subcontract, was less than the prospective subcontract cost estimate submitted by the Contractor; provided, that the actual subcontract price was not itself affected by defective cost or pricing data.

(c)(1) If the Contracting Officer determines under paragraph (a) of this clause that a price or cost reduction should be made, the Contractor agrees not to raise the following matters as a defense:

(i) The Contractor or subcontractor was a sole source supplier or otherwise was in a superior bargaining position and thus the price of the contract would not have been modified even if accurate, complete, and current cost or pricing data had been submitted.

(ii) The Contracting Officer should have known that the cost or pricing data in issue were defective even though the Contractor or subcontractor took no affirmative action to bring the character of the data to the attention of the Contracting Officer.

(iii) The contract was based on an agreement about the total cost of the contract and there was no agreement about the cost of each item procured under the contract.

(iv) The Contractor or subcontractor did not submit a Certificate of Current Cost or Pricing Data.

(2)(i) Except as prohibited by subdivision (c)(2)(ii) of this clause, an offset in an amount determined appropriate by the (2)(i) Except as prohibited by subdivision (c)(2)(ii) of this clause, an offset in an amount determined appropriate by the Contracting Officer based upon the facts shall be allowed against the amount of a contract price reduction if--

(A) The Contractor certifies to the Contracting Officer that, to the best of the Contractor's knowledge and belief, the Contractor is entitled to the offset in the amount requested; and

(B) The Contractor proves that the cost or pricing data were available before the "as of" date specified on its Certificate of Current Cost or Pricing Data, and that the data were not submitted before such date.

(ii) An offset shall not be allowed if--

(A) The understated data were known by the Contractor to be understated before the "as of" date specified on its Certificate of Current Cost or Pricing Data; or

(B) The Government proves that the facts demonstrate that the contract price would not have increased in the amount to be offset even if the available data had been submitted before the "as of" date specified on its Certificate of Current Cost or Pricing Data.

(d) If any reduction in the contract price under this clause reduces the price of items for which payment was made prior to the date of the modification reflecting the price reduction, the Contractor shall be liable to and shall pay the United States at the time such overpayment is repaid--

(1) Simple interest on the amount of such overpayment to be computed from the date(s) of overpayment to the Contractor to the date the Government is repaid by the Contractor at the applicable underpayment rate effective for each quarter prescribed by the Secretary of the Treasury under 26 U.S.C. 6621(a)(2); and

(2) A penalty equal to the amount of the overpayment, if the Contractor or subcontractor knowingly submitted cost or pricing data that were incomplete, inaccurate, or noncurrent.

(End of clause)

21. *FAR 52.215-12 SUBCONTRACTOR COST OR PRICING DATA (OCT 1997)

(a) Before awarding any subcontract expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, on the date of agreement on price or the date of award, whichever is later; or before pricing any subcontract modification involving a pricing adjustment expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, the Contractor shall require the subcontractor to submit cost or pricing data (actually or by specific identification in writing), unless an exception under FAR 15.403-1 applies.

(b) The Contractor shall require the subcontractor to certify in substantially the form prescribed in FAR 15.406-2 that, to the best of its knowledge and belief, the data submitted under paragraph (a) of this clause were accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract modification.

(c) In each subcontract that exceeds the threshold for submission of cost or pricing data at FAR 15.403-4, when entered into, the Contractor shall insert either--

(1) The substance of this clause, including this paragraph (c), if paragraph (a) of this clause requires submission of cost or pricing data for the subcontract; or

(2) The substance of the clause at FAR 52.215-13, Subcontractor Cost or Pricing Data--
Modifications.

(End of clause)

22. *FAR 52.215-15 PENSION ADJUSTMENTS AND ASSET REVERSIONS (DEC 1998)

(a) The Contractor shall promptly notify the Contracting Officer in writing when it determines that it will terminate a defined-benefit pension plan or otherwise recapture such pension fund assets.

(b) For segment closings, pension plan terminations, or curtailment of benefits, the adjustment amount shall be the amount measured, assigned, and allocated in accordance with 48 CFR 9904.413-50(c)(12) for contracts and subcontracts that are subject to Cost Accounting Standards (CAS) Board rules and regulations (48 CFR Chapter 99). For contracts and subcontracts that are not subject to CAS, the adjustment amount shall be the amount measured, assigned, and allocated in accordance with 48 CFR 9904.413-50(c)(12), except the numerator of the fraction at 48 CFR 9904.413-50(c)(12)(vi) shall be the sum of the pension plan costs allocated to all non-CAS-covered contracts and subcontracts that are subject to Federal Acquisition Regulation (FAR) Subpart 31.2 or for which cost or pricing data were submitted.

(c) For all other situations where assets revert to the Contractor, or such assets are constructively received by it for any reason, the Contractor shall, at the Government's option, make a refund or give a credit to the Government for its equitable share of the gross amount withdrawn. The Government's equitable share shall reflect the Government's participation in pension costs through those contracts for which cost or pricing data were submitted or that are subject to FAR Subpart 31.2.

(d) The Contractor shall include the substance of this clause in all subcontracts under this contract that meet the applicability requirement of FAR 15.408(g).

(End of clause)

23. *FAR 52.215-16 FACILITIES CAPITAL COST OF MONEY (OCT 1997)

(a) Facilities capital cost of money will be an allowable cost under the contemplated contract, if the criteria for allowability in subparagraph 31.205-10(a)(2) of the Federal Acquisition Regulation are met. One of the allowability criteria requires the prospective contractor to propose facilities capital cost of money in its offer.

(b) If the prospective Contractor does not propose this cost, the resulting contract will include the clause Waiver of Facilities Capital Cost of Money.
(End of provision)

24. *FAR 52.215-17 WAIVER OF FACILITIES CAPITAL COST OF MONEY (OCT 1997)

The Contractor did not include facilities capital cost of money as a proposed cost of this contract. Therefore, it is an unallowable cost under this contract.
(End of clause)

25. *FAR 52.215-18 REVERSION OR ADJUSTMENT OF PLANS FOR POST RETIREMENT BENEFITS (PRB) OTHER THAN PENSIONS (OCT 1997)

The Contractor shall promptly notify the Contracting Officer in writing when it determines that it will terminate or reduce a PRB plan. If PRB fund assets revert, or inure, to the Contractor or are constructively received by it under a plan termination or otherwise, the Contractor shall make a refund or give a credit to the Government for its equitable share as required by FAR 31.205-6(o)(6). The Contractor shall include the substance of this clause in all subcontracts under this contract that meet the applicability requirements of FAR 15.408(j).

(End of clause)

26. *FAR 52.219-4 NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS (JAN 1999)

(a) *Definition.* "HUBZone small business concern," as used in this clause, means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

(b) *Evaluation preference.* (1) Offers will be evaluated by adding a factor of 10 percent to the price of all offers, except—

(i) Offers from HUBZone small business concerns that have not waived the evaluation preference;

(ii) Otherwise successful offers from small business concerns;

(iii) Otherwise successful offers of eligible products under the Trade Agreements Act when the dollar threshold for application of the Act is exceeded (see 25.402 of the Federal Acquisition Regulation (FAR)); and

(iv) Otherwise successful offers where application of the factor would be inconsistent with a Memorandum of Understanding or other international agreement with a foreign government.

(2) The factor of 10 percent shall be applied on a line item basis or to any group of items on which award may be made. Other evaluation factors described in the solicitation shall be applied before application of the factor.

(3) A concern that is both a HUBZone small business concern and a small disadvantaged business concern will receive the benefit of both the HUBZone small business price evaluation preference and the small disadvantaged business price evaluation adjustment (see FAR clause 52.219-23). Each applicable price evaluation

preference or adjustment shall be calculated independently against an offeror's base offer. These individual preference amounts shall be added together to arrive at the total evaluated price for that offer.

(c) *Waiver of evaluation preference.* A HUBZone small business concern may elect to waive the evaluation preference, in which case the factor will be added to its offer for evaluation purposes. The agreements in paragraph (d) of this clause do not apply if the offeror has waived the evaluation preference.

[] Offeror elects to waive the evaluation preference.

(d) *Agreement.* A HUBZone small business concern agrees that in the performance of the contract, in the case of a contract for—

(1) Services (except construction), at least 50 percent of the cost of personnel for contract performance will be spent for employees of the concern or employees of other HUBZone small business concerns;

(2) Supplies (other than procurement from a nonmanufacturer of such supplies), at least 50 percent of the cost of manufacturing, excluding the cost of materials, will be performed by the concern or other HUBZone small business concerns;

(3) General construction, at least 15 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns; or

(4) Construction by special trade contractors, at least 25 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns.

(e) A HUBZone joint venture agrees that in the performance of the contract, the applicable percentage specified in paragraph (d) of this clause will be performed by the HUBZone small business participant or participants.

(f) A HUBZone small business concern nonmanufacturer agrees to furnish in performing this contract only end items manufactured or produced by HUBZone small business manufacturer concerns. This paragraph does not apply in connection with construction or service contracts.

(End of clause)

27. *FAR 52.219-8

UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2000)

(a) It is the policy of the United States that small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns shall have the maximum practicable opportunity to participate in performing contracts let by any Federal agency, including contracts and subcontracts for subsystems, assemblies, components, and related services for major systems. It is further the policy of the United States that its prime contractors establish procedures to ensure the timely payment of amounts due pursuant to the terms of their subcontracts with small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns.

(b) The Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with efficient contract performance. The Contractor further agrees to cooperate in any studies or surveys as may be conducted by the United States Small Business Administration or the awarding agency of the United States as may be necessary to determine the extent of the Contractor's compliance with this clause.

(c) *Definitions.* As used in this contract—

“HUBZone small business concern” means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

“Service-disabled veteran-owned small business concern” —

(1) Means a small business concern—

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or

permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

“Small business concern” means a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto.

“Small disadvantaged business concern” means a small business concern that represents, as part of its offer that—

(1) It has received certification as a small disadvantaged business concern consistent with 13 CFR part 124, Subpart B;

(2) No material change in disadvantaged ownership and control has occurred since its certification;

(3) Where the concern is owned by one or more individuals, the net worth of each individual upon whom the certification is based does not exceed \$750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); and

(4) It is identified, on the date of its representation, as a certified small disadvantaged business in the database maintained by the Small Business Administration (PRO-Net).

“Veteran-owned small business concern” means a small business concern—

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

“Women-owned small business concern” means a small business concern—

(1) That is at least 51 percent owned by one or more women, or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) Contractors acting in good faith may rely on written representations by their subcontractors regarding their status as a small business concern, a veteran-owned small business concern, a service-disabled veteran-owned small business concern, a HUBZone small business concern, a small disadvantaged business concern, or a women-owned small business concern.

(End of clause)

28. *FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (OCT 2001) [When Contracting By Negotiations]

(a) This clause does not apply to small business concerns.

(b) *Definitions.* As used in this clause—

“Commercial item” means a product or service that satisfies the definition of commercial item in section 2.101 of the Federal Acquisition Regulation.

“Commercial plan” means a subcontracting plan (including goals) that covers the offeror’s fiscal year and that applies to the entire production of commercial items sold by either the entire company or a portion thereof (e.g., division, plant, or product line).

“Individual contract plan” means a subcontracting plan that covers the entire contract period (including option periods), applies to a specific contract, and has goals that are based on the offeror’s planned subcontracting in support of the specific contract, except that indirect costs incurred for common or joint purposes may be allocated on a prorated basis to the contract.

“Master plan” means a subcontracting plan that contains all the required elements of an individual contract plan, except goals, and may be incorporated into individual contract plans, provided the master plan has been approved.

“Subcontract” means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

(c) The offeror, upon request by the Contracting Officer, shall submit and negotiate a subcontracting plan,

where applicable, that separately addresses subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business concerns, small disadvantaged business, and women-owned small business concerns. If the offeror is submitting an individual contract plan, the plan must separately address subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns, with a separate part for the basic contract and separate parts for each option (if any). The plan shall be included in and made a part of the resultant contract. The subcontracting plan shall be negotiated within the time specified by the Contracting Officer. Failure to submit and negotiate the subcontracting plan shall make the offeror ineligible for award of a contract.

(d) The offeror's subcontracting plan shall include the following:

(1) Goals, expressed in terms of percentages of total planned subcontracting dollars, for the use of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns as subcontractors. Service-disabled veteran-owned small business concerns meet the definition of veteran-owned small business concerns, and offerors may include them within the subcontracting plan goal for veteran-owned small business concerns. A separate goal for service-disabled veteran-owned small business concerns is not required. The offeror shall include all subcontracts that contribute to contract performance, and may include a proportionate share of products and services that are normally allocated as indirect costs.

(2) A statement of—

(i) Total dollars planned to be subcontracted for an individual contract plan; or the offeror's total projected sales, expressed in dollars, and the total value of projected subcontracts to support the sales for a commercial plan;

(ii) Total dollars planned to be subcontracted to small business concerns;

(iii) Total dollars planned to be subcontracted to veteran-owned small business concerns;

(iv) Total dollars planned to be subcontracted to service-disabled veteran-owned small business;

(v) Total dollars planned to be subcontracted to HUBZone small business concerns;

(vi) Total dollars planned to be subcontracted to small disadvantaged business concerns; and

(vii) Total dollars planned to be subcontracted to women-owned small business concerns.

(3) A description of the principal types of supplies and services to be subcontracted, and an identification of the types planned for subcontracting to—

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(4) A description of the method used to develop the subcontracting goals in paragraph (d)(1) of this clause.

(5) A description of the method used to identify potential sources for solicitation purposes (*e.g.*, existing company source lists, the Procurement Marketing and Access Network (PRO-Net) of the Small Business Administration (SBA), veterans service organizations, the National Minority Purchasing Council Vendor Information Service, the Research and Information Division of the Minority Business Development Agency in the Department of Commerce, or small, HUBZone, small disadvantaged, and women-owned small business trade associations). A firm may rely on the information contained in PRO-Net as an accurate representation of a concern's size and ownership characteristics for the purposes of maintaining a small, veteran-owned small, service-disabled veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business source list. Use of PRO-Net as its source list does not relieve a firm of its responsibilities (*e.g.*, outreach, assistance, counseling, or publicizing subcontracting opportunities) in this clause.

(6) A statement as to whether or not the offeror included indirect costs in establishing subcontracting goals, and a description of the method used to determine the proportionate share of indirect costs to be incurred with—

(i) Small business concerns;

- (ii) Veteran-owned small business concerns;
- (iii) Service-disabled veteran-owned small business concerns;
- (iv) HUBZone small business concerns;
- (v) Small disadvantaged business concerns; and
- (vi) Women-owned small business concerns.

(7) The name of the individual employed by the offeror who will administer the offeror's subcontracting program, and a description of the duties of the individual.

(8) A description of the efforts the offeror will make to assure that small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns have an equitable opportunity to compete for subcontracts.

(9) Assurances that the offeror will include the clause of this contract entitled "Utilization of Small Business Concerns" in all subcontracts that offer further subcontracting opportunities, and that the offeror will require all subcontractors (except small business concerns) that receive subcontracts in excess of \$500,000 (\$1,000,000 for construction of any public facility) to adopt a subcontracting plan that complies with the requirements of this clause.

(10) Assurances that the offeror will—

(i) Cooperate in any studies or surveys as may be required;

(ii) Submit periodic reports so that the Government can determine the extent of compliance by the offeror with the subcontracting plan;

(iii) Submit Standard Form (SF) 294, Subcontracting Report for Individual Contracts, and/or SF 295, Summary Subcontract Report, in accordance with paragraph (j) of this clause. The reports shall provide information on subcontract awards to small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, women-owned small business concerns, and Historically Black Colleges and Universities and Minority Institutions. Reporting shall be in accordance with the instructions on the forms or as provided in agency regulations.

(iv) Ensure that its subcontractors agree to submit SF 294 and SF 295.

(11) A description of the types of records that will be maintained concerning procedures that have been adopted to comply with the requirements and goals in the plan, including establishing source lists; and a description of the offeror's efforts to locate small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns and award subcontracts to them. The records shall include at least the following (on a plant-wide or company-wide basis, unless otherwise indicated):

(i) Source lists (*e.g.*, PRO-Net), guides, and other data that identify small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns.

(ii) Organizations contacted in an attempt to locate sources that are small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, or women-owned small business concerns.

(iii) Records on each subcontract solicitation resulting in an award of more than \$100,000, indicating—

- (A) Whether small business concerns were solicited and, if not, why not;
- (B) Whether veteran-owned small business concerns were solicited and, if not, why not;
- (C) Whether service-disabled veteran-owned small business concerns were solicited and, if not, why not;
- (D) Whether HUBZone small business concerns were solicited and, if not, why not;
- (E) Whether small disadvantaged business concerns were solicited and, if not, why not;
- (F) Whether women-owned small business concerns were solicited and, if not, why not; and

(G) If applicable, the reason award was not made to a small business concern.

(iv) Records of any outreach efforts to contact—

(A) Trade associations;
(B) Business development organizations;
(C) Conferences and trade fairs to locate small, HUBZone small, small disadvantaged, and women-owned small business sources; and
(D) Veterans service organizations.

(v) Records of internal guidance and encouragement provided to buyers through—
(A) Workshops, seminars, training, etc.; and
(B) Monitoring performance to evaluate compliance with the program's requirements.

(vi) On a contract-by-contract basis, records to support award data submitted by the offeror to the Government, including the name, address, and business size of each subcontractor. Contractors having commercial plans need not comply with this requirement.

(e) In order to effectively implement this plan to the extent consistent with efficient contract performance, the Contractor shall perform the following functions:

(1) Assist small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns by arranging solicitations, time for the preparation of bids, quantities, specifications, and delivery schedules so as to facilitate the participation by such concerns. Where the Contractor's lists of potential small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business subcontractors are excessively long, reasonable effort shall be made to give all such small business concerns an opportunity to compete over a period of time.

(2) Provide adequate and timely consideration of the potentialities of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns in all "make-or-buy" decisions.

(3) Counsel and discuss subcontracting opportunities with representatives of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business firms.

(4) Provide notice to subcontractors concerning penalties and remedies for misrepresentations of business status as small, veteran-owned small business, HUBZone small, small disadvantaged, or women-owned small business for the purpose of obtaining a subcontract that is to be included as part or all of a goal contained in the Contractor's subcontracting plan.

(f) A master plan on a plant or division-wide basis that contains all the elements required by paragraph (d) of this clause, except goals, may be incorporated by reference as a part of the subcontracting plan required of the offeror by this clause; provided —

(1) The master plan has been approved;
(2) The offeror ensures that the master plan is updated as necessary and provides copies of the approved master plan, including evidence of its approval, to the Contracting Officer; and
(3) Goals and any deviations from the master plan deemed necessary by the Contracting Officer to satisfy the requirements of this contract are set forth in the individual subcontracting plan.

(g) A commercial plan is the preferred type of subcontracting plan for contractors furnishing commercial items. The commercial plan shall relate to the offeror's planned subcontracting generally, for both commercial and Government business, rather than solely to the Government contract. Commercial plans are also preferred for subcontractors that provide commercial items under a prime contract, whether or not the prime contractor is supplying a commercial item.

(h) Prior compliance of the offeror with other such subcontracting plans under previous contracts will be considered by the Contracting Officer in determining the responsibility of the offeror for award of the contract.

(i) The failure of the Contractor or subcontractor to comply in good faith with—

(1) The clause of this contract entitled "Utilization Of Small Business Concerns;" or
(2) An approved plan required by this clause, shall be a material breach of the contract.

(j) The Contractor shall submit the following reports:

(1) *Standard Form 294, Subcontracting Report for Individual Contracts*. This report shall be submitted to the Contracting Officer semiannually and at contract completion. The report covers subcontract award data related to this contract. This report is not required for commercial plans.

(2) *Standard Form 295, Summary Subcontract Report*. This report encompasses all of the

contracts with the awarding agency. It must be submitted semi-annually for contracts with the Department of Defense and annually for contracts with civilian agencies. If the reporting activity is covered by a commercial plan, the reporting activity must report annually all subcontract awards under that plan. All reports submitted at the close of each fiscal year (both individual and commercial plans) shall include a breakout, in the Contractor's format, of subcontract awards, in whole dollars, to small disadvantaged business concerns by North American Industry Classification System (NAICS) Industry Subsector. For a commercial plan, the Contractor may obtain from each of its subcontractors a predominant NAICS Industry Subsector and report all awards to that subcontractor under its predominant NAICS Industry Subsector.
(End of clause)

29. *FAR 52.219-16 LIQUIDATED DAMAGES-SUBCONTRACTING PLAN (JAN 1999)

(a) Failure to make a good faith effort to comply with the subcontracting plan, as used in this clause, means a willful or intentional failure to perform in accordance with the requirements of the subcontracting plan approved under the clause in this contract entitled "Small Business Subcontracting Plan," or willful or intentional action to frustrate the plan.

(b) Performance shall be measured by applying the percentage goals to the total actual subcontracting dollars or, if a commercial plan is involved, to the pro rata share of actual subcontracting dollars attributable to Government contracts covered by the commercial plan. If, at contract completion, or in the case of a commercial plan, at the close of the fiscal year for which the plan is applicable, the Contractor has failed to meet its subcontracting goals and the Contracting Officer decides in accordance with paragraph (c) of this clause that the Contractor failed to make a good faith effort to comply with its subcontracting plan, established in accordance with the clause in this contract entitled "Small Business Subcontracting Plan," the Contractor shall pay the Government liquidated damages in an amount stated. The amount of probable damages attributable to the Contractor's failure to comply shall be an amount equal to the actual dollar amount by which the Contractor failed to achieve each subcontract goal.

(c) Before the Contracting Officer makes a final decision that the Contractor has failed to make such good faith effort, the Contracting Officer shall give the Contractor written notice specifying the failure and permitting the Contractor to demonstrate what good faith efforts have been made and to discuss the matter. Failure to respond to the notice may be taken as an admission that no valid explanation exists. If, after consideration of all the pertinent data, the Contracting Officer finds that the Contractor failed to make a good faith effort to comply with the subcontracting plan, the Contracting Officer shall issue a final decision to that effect and require that the Contractor pay the Government liquidated damages as provided in paragraph (b) of this clause.

(d) With respect to commercial plans, the Contracting Officer who approved the plan will perform the functions of the Contracting Officer under this clause on behalf of all agencies with contracts covered by a commercial plan.

(e) The Contractor shall have the right of appeal, under the clause in this contract entitled, Disputes, from any final decision of the Contracting Officer.

(f) Liquidated damages shall be in addition to any other remedies that the Government may have.

30. DFARS 252.219-7003 SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (DOD CONTRACTS) (APR 1996)

This clause supplements the Federal Acquisition Regulation 52.219-9, Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan, clause of this contract.

(a) Definitions.

"Historically black colleges and universities," as used in this clause, means institutions determined by the Secretary of Education to meet the requirements of 34 CFR Section 608.2. The term also means any nonprofit research institution that was an integral part of such a college or university before November 14, 1986.

"Minority institutions," as used in this clause, means institutions meeting the requirements of Section 1046(3) of the Higher Education Act of 1965 (20 U.S.C. 1135d-5(3)). The term also includes Hispanic-serving institutions as defined in Section 316(b)(1) of such Act (20 U.S.C. 1059c(b)(1)).

(b) Except for company or division-wide commercial products subcontracting plans, the term "small disadvantaged business," when used in the FAR 52.219-9 clause, includes historically black colleges and universities and minority institutions in addition to small disadvantaged business concerns.

(c) Work under the contract or its subcontracts shall be credited toward meeting the small disadvantaged business concern goal required by paragraph (d) of the FAR 52.219-9 clause when:

(1) It is performed on Indian lands or in joint venture with an Indian tribe or a tribally-owned corporation, and

(2) It meets the requirements of 10 U.S.C. 2323a.

(d) Subcontracts awarded to workshops approved by the Committee for Purchase from People Who are Blind or Severely Disabled (41 U.S.C. 46-48), may be counted toward the Contractor's small business subcontracting goal.

(e) A mentor firm, under the Pilot Mentor-Protege Program established under Section 831 of Pub. L. 101-510, as amended, may count toward its small disadvantaged business goal, subcontracts awarded--

(1) Protege firms which are qualified organizations employing the severely handicapped; and

(2) Former protege firms that meet the criteria in Section 831(g)(4) of Pub. L. 101-510.

(f) The master plan approval referred to in paragraph (f) of the FAR 52.219-9 clause is approval by the Contractor's cognizant contract administration activity.

(g) In those subcontracting plans which specifically identify small, small disadvantaged, and women-owned businesses, the Contractor shall notify the Administrative Contracting Officer of any substitutions of firms that are not small, small disadvantaged, or women-owned small businesses for the firms listed in the subcontracting plan. Notifications shall be in writing and shall occur within a reasonable period of time after award of the subcontract. Contractor-specified formats shall be acceptable.

31. DFARS 252.219-7004 SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (TEST PROGRAM) (JUN 1997)

(a) Definition. "Subcontract," as used in this clause, means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

(b) The Offeror's comprehensive small business subcontracting plan and its successors, which are authorized by and approved under the test program of Section 834 of Pub. L. 101-189, shall be included in and made a part of the resultant contract. Upon expulsion from the test program or expiration of the test program, the Contractor shall negotiate an individual subcontracting plan for all future contracts that meet the requirements of Section 211 of Publ. L. 95-507.

(c) The Contractor shall submit Standard Form 295, Summary Subcontract Report, in accordance with the instructions on the form, except--

(1) One copy of SF 295 and attachments shall be submitted to Director, Small and Disadvantaged Business Utilization, Office of the Deputy Under Secretary of Defense (International and Commercial Programs), 3061 Defense Pentagon, Room 2A338, Washington, DC 20301-3061; and

(2) Item 14, Remarks, shall be completed to include semi-annual cumulative--

(1) Small business, small disadvantaged business and women-owned small business goals; and

(2) Small business and small disadvantaged business goals, actual accomplishments, and percentages for each of the two designated industry categories.

(d) The failure of the Contractor or subcontractor to comply in good faith with (1) the clause of this contract entitled "Utilization of Small, Small Disadvantaged and Women-Owned Small Business Concerns," or (2) an approved plan required by this clause, shall be a material breach of the contract.

32. DFARS 252.219-7009

SECTION 8(a) DIRECT AWARD (JUN 1998)

(a) This contract is issued as a direct award between the contracting office and the 8(a) Contractor pursuant to the Memorandum of Understanding dated May 6, 1998, between the Small Business Administration (SBA) and the Department of Defense. Accordingly, the SBA is not a party to this contract. SBA does retain responsibility for 8(a) certification, for 8(a) eligibility determinations and related issues, and for providing counseling and assistance to the 8(a) Contractor under the 8(a) Program. The cognizant SBA district office is:

[To be completed by the Contracting Officer at the time of award]

(b) The contracting office is responsible for administering the contract and for taking any action on behalf of the Government under the terms and conditions of the contract; provided that the contracting office shall give advance notice to the SBA before it issues a final notice terminating performance, either in whole or in part, under the contract. The contracting office also shall coordinate with the SBA prior to processing any novation agreement. The contracting office may assign contract administration functions to a contract administration office.

(c) The Contractor agrees that--

(1) It will notify the Contracting Officer, simultaneous with its notification to the SBA (as required by SBA's 8(a) regulations at 13 CFR 124.308), when the owner or owners upon whom 8(a) eligibility is based plan to relinquish ownership or control of the concern. Consistent with Section 407 of Pub. L. 100-656, transfer of ownership or control shall result in termination of the contract for convenience, unless the SBA waives the requirement for termination prior to the actual relinquishing of ownership and control; and

(2) It will not subcontract the performance of any of the requirements of this contract without the prior written approval of the SBA and the Contracting Officer.

(End of clause)

33. DFARS 252.219-7010

ALTERNATE A (JUN 1998)

[When Competitive 8(a) Contracting Procedures are used]

As prescribed in 219.811-3(2), substitute the following paragraph (c) for paragraph (c) of the clause at FAR 52.219-18:

(c) Any award resulting from this solicitation will be made directly by the Contracting Officer to the successful 8(a) offeror selected through the evaluation criteria set forth in this solicitation.

34. *FAR 52.222-1

NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)

If the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the Contractor shall immediately give notice, including all relevant information, to the Contracting Officer. (End of clause)

35. *FAR 52.222-3

CONVICT LABOR (AUG 1996)

The Contractor agrees not to employ in the performance of this contract any person undergoing a sentence of imprisonment which has been imposed by any court of a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands. This limitation, however, shall not prohibit the employment by the Contractor in the performance of this contract of persons on parole or probation to work at paid employment during the term of their sentence or persons who have been pardoned or who have served their terms. Nor shall it prohibit the employment by the Contractor in the performance of this contract of persons confined for violation of the laws of any of the States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands who are authorized to work at paid employment in the community under the laws of such jurisdiction, if --

- (a) (1) The worker is paid or is in an approved work training program on a voluntary basis;
- (2) Representatives of local union central bodies or similar labor union organizations have been consulted;
- (3) Such paid employment will not result in the displacement of employed workers, or be applied in skills, crafts, or trades in which there is a surplus of available gainful labor in the locality, or impair existing contracts for services; and
- (4) The rates of pay and other conditions of employment will not be less than those paid or provided for work of a similar nature in the locality in which the work is being performed; and
- (b) The Attorney General of the United States has certified that the work-release laws or regulations of the jurisdiction involved are in conformity with the requirements of Executive Order 11755, as amended by Executive Orders 12608 and 12943.

36. *FAR 52.222-4

**CONTRACT WORK HOURS AND SAFETY STANDARDS ACT—
OVERTIME COMPENSATION (SEPT 2000)**

(a) *Overtime requirements.* No Contractor or subcontractor employing laborers or mechanics (see Federal Acquisition Regulation 22.300) shall require or permit them to work over 40 hours in any workweek unless they are paid at least 1 and 1/2 times the basic rate of pay for each hour worked over 40 hours.

(b) *Violation; liability for unpaid wages; liquidated damages.* The responsible Contractor and subcontractor are liable for unpaid wages if they violate the terms in paragraph (a) of this clause. In addition, the Contractor and subcontractor are liable for liquidated damages payable to the Government. The Contracting Officer will assess liquidated damages at the rate of \$10 per affected employee for each calendar day on which the employer required or permitted the employee to work in excess of the standard workweek of 40 hours without paying overtime wages required by the Contract Work Hours and Safety Standards Act.

(c) *Withholding for unpaid wages and liquidated damages.* The Contracting Officer will withhold from payments due under the contract sufficient funds required to satisfy any Contractor or subcontractor liabilities for unpaid wages and liquidated damages. If amounts withheld under the contract are insufficient to satisfy Contractor or subcontractor liabilities, the Contracting Officer will withhold payments from other Federal or Federally assisted contracts held by the same Contractor that are subject to the Contract Work Hours and Safety Standards Act.

(d) *Payrolls and basic records.* (1) The Contractor and its subcontractors shall maintain payrolls and basic payroll records for all laborers and mechanics working on the contract during the contract and shall make them available to the Government until 3 years after contract completion. The records shall contain the name and address of each employee, social security number, labor classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. The records need not duplicate those required for construction work by Department of Labor regulations at 29 CFR 5.5(a)(3) implementing the Davis-Bacon Act .

(2) The Contractor and its subcontractors shall allow authorized representatives of the Contracting Officer or the Department of Labor to inspect, copy, or transcribe records maintained under paragraph (d)(1) of this clause. The Contractor or subcontractor also shall allow authorized representatives of the Contracting Officer or Department of Labor to interview employees in the workplace during working hours.

(e) *Subcontracts.* The Contractor shall insert the provisions set forth in paragraphs (a) through (d) of this clause in subcontracts exceeding \$100,000 and require subcontractors to include these provisions in any lower-tier subcontracts. The Contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor with the provisions set forth in paragraphs (a) through (d) of this clause.

(End of clause)

(a) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (d) of this clause; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such period. Such laborers and mechanics shall be paid not less than the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in the clause entitled Apprentices and Trainees. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph (b) of this clause) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(b) (1) The Contracting Officer shall require that any class of laborers or mechanics, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The Contracting Officer shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination.

(ii) The classification is utilized in the area by the construction industry.

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the Contractor and laborers and mechanics to be employed in the classification (if known), or their representatives, and the Contracting Officer agree on the classification and wage rate (including the amount designated for fringe benefits, where appropriate), a report of the action taken shall be sent by the Contracting Officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator or an authorized representative will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(3) In the event the Contractor, the laborers or mechanics to be employed in the classification, or their representatives, and the Contracting Officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the Contracting Officer shall refer the questions, including the views of all interested parties and the recommendation of the Contracting Officer, to the Administrator of the Wage and Hour Division for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits, where appropriate) determined pursuant to subparagraphs (b)(2) and (b)(3) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(c) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(d) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of

Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

38. *FAR 52.222-7

WITHHOLDING OF FUNDS (FEB 1988)

The Contracting Officer shall, upon his or her own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same Prime Contractor, or any other Federally assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same Prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the Contracting Officer may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

39. *FAR 52.222-8

PAYROLLS AND BASIC RECORDS (FEB 1988)

(a) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of 3 years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under paragraph (d) of the clause entitled Davis-Bacon Act, that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(b) (1) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Contracting Officer. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under paragraph (a) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. The Prime Contractor is responsible for the submission of copies of payrolls by all subcontractors.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify--

(i) That the payroll for the payroll period contains the information required to be maintained under paragraph (a) of this clause and that such information is correct and complete ;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR Part 3; and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph (b)(2) of this clause.

(4) The falsification of any of the certifications in this clause may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.

(c) The Contractor or subcontractor shall make the records required under paragraph (a) of this clause available for inspection, copying, or transcription by the Contracting Officer or authorized representatives of the Contracting Officer or the Department of Labor. The Contractor or subcontractor shall permit the Contracting Officer or representatives of the Contracting Officer or the Department of Labor to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit required records or to make them available, the Contracting Officer may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

40. *FAR 52.222-9

APPRENTICES AND TRAINEES (FEB 1988)

(a) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph, shall be paid not less than the applicable wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the Contractor will not longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(b) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the

corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(c) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

41. *FAR 52.222-10 COMPLIANCE WITH COPELAND ACT REQUIREMENTS (FEB 1988)

The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.

42. *FAR 52.222-11 SUBCONTRACTS (LABOR STANDARDS) (FEB 1988)

(a) The Contractor or subcontractor shall insert in any subcontracts the clauses entitled Davis-Bacon Act, Contract Work Hours and Safety Standards Act--Overtime Compensation, Apprentices and Trainees, Payrolls and Basic Records, Compliance with Copeland Act Requirements, Withholding of Funds, Subcontracts (Labor Standards), Contract Termination--Debarment, Disputes Concerning Labor Standards, Compliance with Davis-Bacon and Related Act Regulations, and Certification of Eligibility, and such other clauses as the Contracting Officer may, by appropriate instructions, require, and also a clause requiring subcontractors to include these clauses in any lower tier subcontracts. The Prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with all the contract clauses cited in this paragraph.

(b) (1) Within 14 days after award of the contract, the Contractor shall deliver to the Contracting Officer a completed Statement and Acknowledgment Form (SF 1413) for each subcontract, including the subcontractor's signed and dated acknowledgment that the clauses set forth in paragraph (a) of this clause have been included in the subcontract.

(2) Within 14 days after the award of any subsequently awarded subcontract the Contractor shall deliver to the Contracting Officer an updated completed SF 1413 for such additional subcontract.

43. *FAR 52.222-12 CONTRACT TERMINATION--DEBARMENT (FEB 1988)

A breach of the contract clauses entitled Davis-Bacon Act, Contract Work Hours and Safety Standards Act--Overtime Compensation, Apprentices and Trainees, Payrolls and Basic Records, Compliance with Copeland Act Requirements, Subcontracts (Labor Standards), Compliance with Davis-Bacon and Related Act Regulations, or Certification of Eligibility may be grounds for termination of the contract, and for debarment as a Contractor and subcontractor as provided in 29 CFR 5.12.

44. *FAR 52.222-13 COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are hereby incorporated by reference in this contract.

45. *FAR 52.222-14 DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)

The United States Department of Labor has set forth in 29 CFR Parts 5, 6, and 7 procedures for resolving disputes concerning labor standards requirements. Such disputes shall be resolved in accordance with those procedures and not the Disputes clause of this contract. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency the U.S. Department of Labor, or the employees of their representatives.

46. *FAR 52.222-15 CERTIFICATION OF ELIGIBILITY (FEB 1988)

(a) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(b) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(c) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

47. *FAR 52.222-26 EQUAL OPPORTUNITY (FEB 1999)

(a) If, during any 12-month period (including the 12 months preceding the award of this contract), the Contractor has been or is awarded nonexempt Federal contracts and/or subcontracts that have an aggregate value in excess of \$10,000, the Contractor shall comply with subparagraphs (b)(1) through (11) of this clause. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.

(b) During performing this contract, the Contractor agrees as follows:

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. However, it shall not be a violation of this clause for the Contractor to extend a publicly announced preference in employment to Indians living on or near an Indian reservation, in connection with employment opportunities on or near an Indian reservation, as permitted by 41 CFR 60-1.5.

(2) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. This shall include, but not be limited to, (i) employment, (ii) upgrading, (iii) demotion, (iv) transfer, (v) recruitment or recruitment advertising, (vi) layoff or termination, (vii) rates of pay or other forms of compensation, and (viii) selection for training, including apprenticeship.

(3) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.

(4) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(5) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

(6) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

(7) The Contractor shall furnish to the contracting agency all information required by Executive Order 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. The Contractor shall also file Standard Form 100 (EEO-1), or any successor form, as prescribed in 41 CFR part 60-1. Unless the Contractor has filed within the 12 months preceding the date of contract award, the Contractor shall, within 30 days after contract award, apply to either the regional Office of Federal Contract Compliance Programs (OFCCP) or the local office of the Equal Employment Opportunity Commission for the necessary forms.

(8) The Contractor shall permit access to its premises, during normal business hours, by the contracting agency or the OFCCP for the purpose of conducting on-site compliance evaluations and complaint investigations. The Contractor shall permit the Government to inspect and copy any books, accounts, records (including computerized records), and other material that may be relevant to the matter under investigation and pertinent to compliance with Executive Order 11246, as amended, and rules and regulations that implement the Executive Order.

(9) If the OFCCP determines that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts, under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended; in the rules, regulations, and orders of the Secretary of Labor; or as otherwise provided by law.

(10) The Contractor shall include the terms and conditions of subparagraph (b)(1) through (11) of this clause in every subcontract or purchase order that is not exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor.

(11) The Contractor shall take such action with respect to any subcontract or purchase order as the Contracting Officer may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance; provided, that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of any direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

(c) Notwithstanding any other clause in this contract, disputes relative to this clause will be governed by the procedures in 41 CFR 60-1.1.

48. *FAR 52.222-27 AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (FEB 1999)

(a) Definitions.

"Covered area," as used in this clause, means the geographical area described in the solicitation for this contract.

"Deputy Assistant Secretary," as used in this clause, means the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, or a designee

"Employer's identification number," as used in this clause, means the Federal Social Security number used on the employer's quarterly Federal tax return, U.S. Treasury Department Form 941.

"Minority," as used in this clause, means--

(1) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

(2) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands);

(3) Black (all persons having origins in any of the black African racial groups not of Hispanic origin); and

(4) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race).

(b) If the Contractor, or a subcontractor at any tier, subcontracts a portion of the work involving any construction trade each such subcontract in excess of \$10,000 shall include this clause and the Notice containing the goals for minority and female participation stated in the solicitation for this contract.

(c) If the Contractor is participating in a Hometown Plan (41 CFR 60-4) approved by the U.S. Department of Labor in a covered area, either individually or through an association, its affirmative action obligations on all work in the plan area (including goals) shall comply with the plan for those trades that have unions participating in the plan. Contractors must be able to demonstrate participation in, and compliance with, the provisions of the plan. Each Contractor or subcontractor participating in an approved plan is also required to comply with its obligations under the Equal Opportunity clause, and to make a good faith effort to achieve each goal

under the plan in each trade in which it has employees. The overall good-faith performance by other Contractors or subcontractors toward a goal in an approved plan does not excuse any Contractor's or subcontractor's failure to make good-faith efforts to achieve the plan's goals.

(d) The Contractor shall implement the affirmative action procedures in subparagraphs (g)(1) through (16) of this clause. The goals stated in the solicitation for this contract are expressed as percentages of the total hours of employment and training of minority and female utilization that the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where that work is actually performed. The Contractor is expected to make substantially uniform progress toward its goals in each craft.

(e) Neither the terms and conditions of any collective bargaining agreement, nor the failure by a union with which the Contractor has a collective bargaining agreement, to refer minorities or women shall excuse the Contractor's obligations under this clause, Executive Order 11246, as amended, or the regulations thereunder.

(f) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

(g) The Contractor shall take affirmative action to ensure equal employment opportunity. The evaluation of the Contractor's compliance with this clause shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and implement affirmative action steps at least as extensive as the following:

(1) Ensure a working environment free of harassment, intimidation, and coercion at all sites and in all facilities where the Contractor's employees are assigned to work. The Contractor, if possible, will assign two or more women to each construction project. The Contractor shall ensure that foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at these sites or facilities.

(2) Establish and maintain a current list of sources for minority and female recruitment. Provide written notification to minority and female recruitment sources and community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

(3) Establish and maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant, referrals of minorities or females from unions, recruitment sources, or community organizations, and the action taken with respect to each individual. If an individual was sent to the union hiring hall for referral and not referred back to the Contractor by the union or, if referred back, not employed by the Contractor, this shall be documented in the file, along with whatever additional actions the Contractor may have taken.

(4) Immediately notify the Deputy Assistant Secretary when the union or unions with which the Contractor has a collective bargaining agreement has not referred back to the Contractor a minority or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

(5) Develop on-the-job training opportunities and/or participate in training programs for the area that expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under subparagraph (g)(2) of this clause.

(6) Disseminate the Contractor's equal employment policy by--

- (i) Providing notice of the policy to unions and to training, recruitment, and outreach programs, and requesting their cooperation in assisting the Contractor in meeting its contract obligations;
- (ii) Including the policy in any policy manual and in collective bargaining agreements;
- (iii) Publicizing the policy in the company newspaper, annual report, etc. ;
- (iv) Reviewing the policy with all management personnel and with all minority and female employees at least once a year; and

(v) Posting the policy on bulletin boards accessible to employees at each location where construction work is performed.

(7) Review, at least annually, the Contractor's equal employment policy and affirmative action obligations with all employees having responsibility for hiring, assignment, layoff, termination, or other employment decisions. Conduct review of this policy with all on-site supervisory personnel before initiating construction work at a job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

(8) Disseminate the Contractor's equal employment policy externally by including it in any advertising in the news media, specifically including minority and female news media. Provide written notification to, and discuss this policy with, other Contractors and subcontractors with which the Contractor does or anticipates doing business.

(9) Direct recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students, and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than 1 month before the date for acceptance of applications for apprenticeship or training by any recruitment source, send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

(10) Encourage present minority and female employees to recruit minority persons and women. Where reasonable, provide after-school, summer, and vacation employment to minority and female youth both on the site and in other areas of the Contractor's workforce.

(11) Validate all tests and other selection requirements where required under 41 CFR 60-3.

(12) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities. Encourage these employees to seek or to prepare for, through appropriate training, etc., opportunities for promotion.

(13) Ensure that seniority practices job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the Contractor's obligations under this contract are being carried out.

(14) Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

(15) Maintain a record of solicitations for subcontracts for minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

(16) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's equal employment policy and affirmative action obligations.

(h) The Contractor is encouraged to participate in voluntary associations that may assist in fulfilling one or more of the affirmative action obligations contained in subparagraphs (g)(1) through (16) of this clause. The efforts of a contractor association, joint contractor-union, contractor-community, or similar group of which the contractor is a member and participant may be asserted as fulfilling one or more of its obligations under subparagraphs (g)(1) through (16) of this clause, provided the Contractor--

(1) Actively participates in the group;

(2) Makes every effort to ensure that the group has a positive impact on the employment of minorities and women in the industry;

(3) Ensures that concrete benefits of the program are reflected in the Contractor's minority and female workforce participation;

(4) Makes a good-faith effort to meet its individual goals and timetables; and

(5) Can provide access to documentation that demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply is the Contractor's, and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

(i) A single goal for minorities and a separate single goal for women shall be established. The Contractor is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and nonminority. Consequently, the Contractor may be in violation of Executive Order 11246, as amended, if a particular group is employed in a substantially disparate manner.

(j) The Contractor shall not use goals or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

(k) The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts under Executive Order 11246, as amended.

(l) The Contractor shall carry out such sanctions and penalties for violation of this clause and of the Equal Opportunity clause, including suspension, termination, and cancellation of existing subcontracts, as may be imposed or ordered under Executive Order 11246, as amended, and its implementing regulations, by the OFCCP. Any failure to carry out these sanctions and penalties as ordered shall be a violation of this clause and Executive Order 11246, as amended.

(m) The Contractor in fulfilling its obligations under this clause shall implement affirmative action procedures at least as extensive as those prescribed in paragraph (g) of this clause, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of Executive Order 11246, as amended, the implementing regulations, or this clause, the Deputy Assistant Secretary shall take action as prescribed in 41 CFR 60-4.8.

(n) The Contractor shall designate a responsible official to--

(1) Monitor all employment-related activity to ensure that the Contractor's equal employment policy is being carried out;

(2) Submit reports as may be required by the Government; and

(3) Keep records that shall at least include for each employee the name, address, telephone number, construction trade, union affiliation (if any), employee identification number, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, separate records are not required to be maintained.

(o) Nothing contained herein shall be construed as a limitation upon the application of other laws that establish different standards of compliance or upon the requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

49. *FAR 52.222-35 EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)

(a) *Definitions.* As used in this clause--

"All employment openings" means all positions except executive and top management, those positions that will be filled from within the Contractor's organization, and positions lasting 3 days or less. This term includes full-time employment, temporary employment of more than 3 days duration, and part-time employment.

"Executive and top management" means any employee--

(1) Whose primary duty consists of the management of the enterprise in which the individual is employed or of a customarily recognized department or subdivision thereof;

(2) Who customarily and regularly directs the work of two or more other employees;

(3) Who has the authority to hire or fire other employees or whose suggestions and recommendations as to the hiring or firing and as to the advancement and promotion or any other change of status of other employees will be given particular weight;

(4) Who customarily and regularly exercises discretionary powers; and

(5) Who does not devote more than 20 percent or, in the case of an employee of a retail or service establishment, who does not devote more than 40 percent of total hours of work in the work week to activities that are not directly and closely related to the performance of the work described in paragraphs (1) through (4) of this definition. This paragraph (5) does not apply in the case of an employee who is in sole charge of an establishment or a physically separated branch establishment, or who owns at least a 20 percent interest in the enterprise in which the individual is employed.

"Other eligible veteran" means any other veteran who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized.

"Positions that will be filled from within the Contractor's organization" means employment openings for

which the Contractor will give no consideration to persons outside the Contractor's organization (including any affiliates, subsidiaries, and parent companies) and includes any openings the Contractor proposes to fill from regularly established "recall" lists. The exception does not apply to a particular opening once an employer decides to consider applicants outside of its organization.

"Qualified special disabled veteran" means a special disabled veteran who satisfies the requisite skill, experience, education, and other job-related requirements of the employment position such veteran holds or desires, and who, with or without reasonable accommodation, can perform the essential functions of such position.

"Special disabled veteran" means—

(1) A veteran who is entitled to compensation (or who but for the receipt of military retired pay would be entitled to compensation) under laws administered by the Department of Veterans Affairs for a disability—

(i) Rated at 30 percent or more; or

(ii) Rated at 10 or 20 percent in the case of a veteran who has been determined under 38 U.S.C. 3106 to have a serious employment handicap (*i.e.*, a significant impairment of the veteran's ability to prepare for, obtain, or retain employment consistent with the veteran's abilities, aptitudes, and interests); or

(2) A person who was discharged or released from active duty because of a service-connected disability.

"Veteran of the Vietnam era" means a person who—

(1) Served on active duty for a period of more than 180 days and was discharged or released from active duty with other than a dishonorable discharge, if any part of such active duty occurred—

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases; or

(2) Was discharged or released from active duty for a service-connected disability if any part of the active duty was performed—

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases.

(b) *General.* (1) The Contractor shall not discriminate against the individual because the individual is a special disabled veteran, a veteran of the Vietnam era, or other eligible veteran, regarding any position for which the employee or applicant for employment is qualified. The Contractor shall take affirmative action to employ, advance in employment, and otherwise treat qualified special disabled veterans, veterans of the Vietnam era, and other eligible veterans without discrimination based upon their disability or veterans' status in all employment practices such as—

(i) Recruitment, advertising, and job application procedures;

(ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff and rehiring;

(iii) Rate of pay or any other form of compensation and changes in compensation;

(iv) Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;

(v) Leaves of absence, sick leave, or any other leave;

(vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;

(vii) Selection and financial support for training, including apprenticeship, and on-the-job training under 38 U.S.C. 3687, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;

(viii) Activities sponsored by the Contractor including social or recreational programs; and

(ix) Any other term, condition, or privilege of employment.

(2) The Contractor shall comply with the rules, regulations, and relevant orders of the Secretary of Labor issued under the Vietnam Era Veterans' Readjustment Assistance Act of 1972 (the Act), as amended (38 U.S.C. 4211 and 4212).

(c) *Listing openings.* (1) The Contractor shall immediately list all employment openings that exist at the time of the execution of this contract and those which occur during the performance of this contract, including those not generated by this contract, and including those occurring at an establishment of the Contractor other than the one where the contract is being performed, but excluding those of independently operated corporate affiliates, at an

appropriate local public employment service office of the State wherein the opening occurs. Listing employment openings with the U.S. Department of Labor's America's Job Bank shall satisfy the requirement to list jobs with the local employment service office.

(2) The Contractor shall make the listing of employment openings with the local employment service office at least concurrently with using any other recruitment source or effort and shall involve the normal obligations of placing a bona fide job order, including accepting referrals of veterans and nonveterans. This listing of employment openings does not require hiring any particular job applicant or hiring from any particular group of job applicants and is not intended to relieve the Contractor from any requirements of Executive orders or regulations concerning nondiscrimination in employment.

(3) Whenever the Contractor becomes contractually bound to the listing terms of this clause, it shall advise the State public employment agency in each State where it has establishments of the name and location of each hiring location in the State. As long as the Contractor is contractually bound to these terms and has so advised the State agency, it need not advise the State agency of subsequent contracts. The Contractor may advise the State agency when it is no longer bound by this contract clause.

(d) *Applicability*. This clause does not apply to the listing of employment openings that occur and are filled outside the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, American Samoa, Guam, the Virgin Islands of the United States, and Wake Island.

(e) *Postings*. (1) The Contractor shall post employment notices in conspicuous places that are available to employees and applicants for employment.

(2) The employment notices shall—

(i) State the rights of applicants and employees as well as the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified employees and applicants who are special disabled veterans, veterans of the Vietnam era, and other eligible veterans; and

(ii) Be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance Programs, Department of Labor (Deputy Assistant Secretary of Labor), and provided by or through the Contracting Officer.

(3) The Contractor shall ensure that applicants or employees who are special disabled veterans are informed of the contents of the notice (e.g., the Contractor may have the notice read to a visually disabled veteran, or may lower the posted notice so that it can be read by a person in a wheelchair).

(4) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement, or other contract understanding, that the Contractor is bound by the terms of the Act and is committed to take affirmative action to employ, and advance in employment, qualified special disabled veterans, veterans of the Vietnam era, and other eligible veterans.

(f) *Noncompliance*. If the Contractor does not comply with the requirements of this clause, the Government may take appropriate actions under the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.

(g) *Subcontracts*. The Contractor shall insert the terms of this clause in all subcontracts or purchase orders of \$25,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor. The Contractor shall act as specified by the Deputy Assistant Secretary of Labor to enforce the terms, including action for noncompliance.

(End of clause)

50. *FAR 52.222-36 AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)

(a) General.

(1) Regarding any position for which the employee or applicant for employment is qualified, the Contractor shall not discriminate against any employee or applicant because of physical or mental disability. The Contractor agrees to take affirmative action to employ, advance in employment, and otherwise treat qualified individuals with disabilities without discrimination based upon their physical or mental disability in all employment practices such as--

(i) Recruitment, advertising, and job application procedures;

- (ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff, and rehiring;
 - (iii) Rates of pay or other forms of compensation and changes in compensation;
 - (iv) Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;
 - (v) Leaves of absence, sick leave, or any other leave;
 - (vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;
 - (vii) Selection and financial support for training, including apprenticeships, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;
 - (viii) Activities sponsored by the Contractor, including social or recreational programs; and
 - (ix) Any other term, condition, or privilege of employment.
- (2) The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor (Secretary) issued under the Rehabilitation Act of 1973 (29 U.S.C. 793) (the Act), as amended.
- (b) Postings.
- (1) The Contractor agrees to post employment notices stating--
 - (i) The Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified individuals with disabilities; and
 - (ii) The rights of applicants and employees.
 - (2) These notices shall be posted in conspicuous places that are available to employees and applicants for employment. The Contractor shall ensure that applicants and employees with disabilities are informed of the contents of the notice (e.g., the Contractor may have the notice read to visually disabled individual, or may lower the posted notice so that it might be read by a person in a wheelchair). The notices shall be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance of the U.S. Department of Labor (Deputy Assistant Secretary) and shall be provided by or through the Contracting Officer.
 - (3) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of Section 503 of the Act and is committed to take affirmative action to employ, and advance in employment, qualified individuals with physical or mental disabilities.
- (c) Noncompliance. If the Contractor does not comply with the requirements of this clause, appropriate actions may be taken under the rules, regulations, and relevant orders of the Secretary issued pursuant to the Act.
- (c) Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order in excess of \$10,000 unless exempted by rules, regulations, or orders of the Secretary. The Contractor shall act as specified by the Deputy Assistant Secretary to enforce the terms, including action for noncompliance.

51. *FAR 52.222-37 EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)

- (a) Unless the Contractor is a State or local government agency, the Contractor shall report at least annually, as required by the Secretary of Labor, on—
- (1) The number of special disabled veterans, the number of veterans of the Vietnam era, and other eligible veterans in the workforce of the Contractor by job category and hiring location; and
 - (2) The total number of new employees hired during the period covered by the report, and of the total, the number of special disabled veterans, the number of veterans of the Vietnam era, and the number of other eligible veterans; and
 - (3) The maximum number and the minimum number of employees of the Contractor during the period covered by the report.
- (b) The Contractor shall report the above items by completing the Form VETS-100, entitled "Federal Contractor Veterans' Employment Report (VETS-100 Report)".
- (c) The Contractor shall submit VETS-100 Reports no later than September 30 of each year beginning

September 30, 1988.

(d) The employment activity report required by paragraph (a)(2) of this clause shall reflect total hires during the most recent 12-month period as of the ending date selected for the employment profile report required by paragraph (a)(1) of this clause. Contractors may select an ending date—

(1) As of the end of any pay period between July 1 and August 31 of the year the report is due; or

(2) As of December 31, if the Contractor has prior written approval from the Equal Employment Opportunity Commission to do so for purposes of submitting the Employer Information Report EEO-1 (Standard Form 100).

(e) The Contractor shall base the count of veterans reported according to paragraph (a) of this clause on voluntary disclosure. Each Contractor subject to the reporting requirements at 38 U.S.C. 4212 shall invite all special disabled veterans, veterans of the Vietnam era, and other eligible veterans who wish to benefit under the affirmative action program at 38 U.S.C. 4212 to identify themselves to the Contractor. The invitation shall state that—

(1) The information is voluntarily provided;

(2) The information will be kept confidential;

(3) Disclosure or refusal to provide the information will not subject the applicant or employee to any adverse treatment; and

(4) The information will be used only in accordance with the regulations promulgated under 38 U.S.C. 4212.

(f) The Contractor shall insert the terms of this clause in all subcontracts or purchase orders of \$25,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor.

(End of clause)

52. *FAR 52.222-38 COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (DEC 2001)

By submission of its offer, the offeror represents that, if it is subject to the reporting requirements of 38 U.S.C. 4212(d) (*i.e.*, if it has any contract containing Federal Acquisition Regulation clause 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans), it has submitted the most recent VETS-100 Report required by that clause.

(End of provision)

53. *FAR 52.223-3 HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997)

(a) "Hazardous material," as used in this clause, includes any material defined as hazardous under the latest version of Federal Standard No. 313 (including revisions adopted during the term of the contract).

(b) The offeror must list any hazardous material, as defined in paragraph (a) of this clause, to be delivered under this contract. The hazardous material shall be properly identified and include any applicable identification number, such as National Stock Number or Special Item Number. This information shall also be included on the Material Safety Data Sheet submitted under this contract.

Material (If none, insert "None")	Identification No.
_____	_____
_____	_____
_____	_____

(c) This list must be updated during performance of the contract whenever the Contractor determines that any other material to be delivered under this contract is hazardous.

(d) The apparently successful offeror agrees to submit, for each item as required prior to award, a Material Safety Data Sheet, meeting the requirements of 29 CFR 1910.1200(g) and the latest version of Federal Standard No. 313, for all hazardous material identified in paragraph (b) of this clause. Data shall be submitted in accordance with

Federal Standard No. 313, whether or not the apparently successful offeror is the actual manufacturer of these items. Failure to submit the Material Safety Data Sheet prior to award may result in the apparently successful offeror being considered nonresponsible and ineligible for award.

(e) If, after award, there is a change in the composition of the item(s) or a revision to Federal Standard No. 313, which renders incomplete or inaccurate the data submitted under paragraph (d) of this clause, the Contractor shall promptly notify the Contracting Officer and resubmit the data.

(f) Neither the requirements of this clause nor any act or failure to act by the Government shall relieve the Contractor of any responsibility or liability for the safety of Government, Contractor, or subcontractor personnel or property.

(g) Nothing contained in this clause shall relieve the Contractor from complying with applicable Federal, State, and local laws, codes, ordinances, and regulations (including the obtaining of licenses and permits) in connection with hazardous material.

(h) The Government's rights in data furnished under this contract with respect to hazardous material are as follows:

(1) To use, duplicate and disclose any data to which this clause is applicable. The purposes of this right are to--

(i) Apprise personnel of the hazards to which they may be exposed in using, handling, packaging, transporting, or disposing of hazardous materials;

(ii) Obtain medical treatment for those affected by the material; and

(iii) Have others use, duplicate, and disclose the data for the Government for these purposes.

(2) To use, duplicate, and disclose data furnished under this clause, in accordance with subparagraph (h)(1) of this clause, in precedence over any other clause of this contract providing for rights in data.

(3) The Government is not precluded from using similar or identical data acquired from other sources. (End of clause)

54. *FAR 52.223-5 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (APR 1998) [For Work on Federal Facilities]

(a) Executive Order 12856 of August 3, 1993, requires Federal facilities to comply with the provisions of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11001-11050) and the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13101-13109).

(b) The Contractor shall provide all information needed by the Federal facility to comply with the emergency planning reporting requirements of Section 302 of EPCRA; the emergency notice requirements of Section 304 of EPCRA; the list of Material Safety Data Sheets required by Section 311 of EPCRA; the emergency and hazardous chemical inventory forms of Section 312 of EPCRA; the toxic chemical release inventory of Section 313 of EPCRA, which includes the reduction and recycling information required by Section 6607 of PPA; and the toxic chemical reduction goals requirements of Section 3-302 of Executive Order 12856.

55. *FAR 52.223-6 DRUG-FREE WORKPLACE (MAY 2001)

(a) Definitions. As used in this clause--

"Controlled substance" means a controlled substance in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined in regulation at 21 CFR 1308.11 - 1308.15.

"Conviction" means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes.

"Criminal drug statute" means a Federal or non-Federal criminal statute involving the manufacture, distribution, dispensing, possession or use of any controlled substance.

"Drug-free workplace" means the site(s) for the performance of work done by the Contractor in connection with a specific contract where employees of the Contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.

"Employee" means an employee of a Contractor directly engaged in the performance of work under a Government contract. "Directly engaged" is defined to include all direct cost employees and any other Contractor employee who has other than a minimal impact or involvement in contract performance.

"Individual" means an offeror/contractor that has no more than one employee including the offeror/contractor.

(b) The Contractor, if other than an individual, shall--within 30 days after award (unless a longer period is agreed to in writing for contracts of 30 days or more performance duration), or as soon as possible for contracts of less than 30 days performance duration--

(1) Publish a statement notifying its employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition;

(2) Establish an ongoing drug-free awareness program to inform such employees about--

(i) The dangers of drug abuse in the workplace;

(ii) The Contractor's policy of maintaining a drug-free workplace;

(iii) Any available drug counseling, rehabilitation, and employee assistance

programs; and

(iv) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.

(3) Provide all employees engaged in performance of the contract with a copy of the statement required by subparagraph (b)(1) of this clause;

(4) Notify such employees in writing in the statement required by subparagraph (b)(1) of this clause that, as a condition of continued employment on this contract, the employee will--

(i) Abide by the terms of the statement; and

(ii) Notify the employer in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than 5 days after such conviction.

(5) Notify the Contracting Officer in writing within 10 days after receiving notice under subdivision (b)(4)(ii) of this clause, from an employee or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee;

(6) Within 30 days after receiving notice under subdivision (b)(4)(ii) of this clause of a conviction, take one of the following actions with respect to any employee who is convicted of a drug abuse violation occurring in the workplace:

(i) Taking appropriate personnel action against such employee, up to and including termination; or

(ii) Require such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency; and

(7) Make a good faith effort to maintain a drug-free workplace through implementation of subparagraphs (b)(1) through (b)(6) of this clause.

(c) The Contractor, if an individual, agrees by award of the contract or acceptance of a purchase order, not to engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance while performing this contract.

(d) In addition to other remedies available to the Government, the Contractor's failure to comply with the requirements of paragraph (b) or (c) of this clause may, pursuant to FAR 23.560, render the Contractor subject to suspension of contract payments, termination of the contract for default, and suspension or debarment.

56. FAR 52.223-9 ESTIMATE OF PERCENTAGE OF RECOVERED MATERIAL CONTENT FOR EPA-DESIGNATED PRODUCTS (AUG 2000) [For Contracts exceeding \$100,000. EPA Designated product (available at <http://www.epa.gov/cpg/>)]

(a) Definitions. As used in this clause—

“Postconsumer material” means a material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. Postconsumer material is a part of the broader category of “recovered material.”

“Recovered material” means waste materials and by-products recovered or diverted from solid waste, but the term does not include those materials and by-products generated from, and commonly reused within, an original manufacturing process.

- (b) The Contractor, on completion of this contract, shall—
- (1) Estimate the percentage of the total recovered material used in contract performance, including, if applicable, the percentage of postconsumer material content; and
 - (2) Submit this estimate to the Contracting Officer.
- (End of clause)

57. *FAR 52.223-14 TOXIC CHEMICAL RELEASE REPORTING (OCT 2000)
[For Contracts Over \$100,000]

(a) Unless otherwise exempt, the Contractor, as owner or operator of a facility used in the performance of this contract, shall file by July 1 for the prior calendar year an annual Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023(a) and (g)), and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106). The Contractor shall file, for each facility subject to the Form R filing and reporting requirements, the annual Form R throughout the life of the contract.

(b) A Contractor owned or operated facility use in the performance of this contract is exempt from the requirement to file an annual Form R if--

(1) The facility does not manufacture, process or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C. 11023(c);

(2) The facility does not have 10 or more full-time employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C. 11023(b)(1)(A);

(3) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

(4) The facility does not fall within Standard Industrial Classification Code (SIC) major groups 20 through 39 or their corresponding North American Industry Classification System (NAICS) sectors 31 through 33; or

(5) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, or any other territory or possession over which the United States has jurisdiction.

(c) If the Contractor has certified to an exemption in accordance with one or more of the criteria in paragraph (b) of this clause, and after award of the contract circumstances change so that any one of its owned or operated facilities used in the performance of this contract is no longer exempt--

(1) The Contractor shall notify the Contracting Officer;

and

(2) The Contractor, as owner or operator of a facility used in the performance of this contract is no longer exempt, shall (i) submit a Toxic Chemical Release Inventory Form (Form R) on or before July 1 for the prior calendar year during which the facility becomes eligible; and (ii) continue to file the annual Form R for the life of the contract for such facility.

(d) The Contracting Officer may terminate this contract or take other action as appropriate, if the Contractor fails to comply accurately and fully with the EPCRA and PPA toxic chemical release filing and reporting requirements.

(e) Except for acquisitions of commercial items, as defined in FAR Part 2, the Contractor shall -

(1) For competitive subcontracts expected to exceed \$100,000 (including all options), include a solicitation provision substantially the same as the provision at FAR 52.223-13, Certification of Toxic Chemical Release Reporting; and

(2) Include in any resultant subcontract exceeding \$100,000 (including all options), the substance of this clause, except this paragraph (e).

58. DFARS 252.223-7006 PROHIBITION ON STORAGE AND DISPOSAL OF TOXIC AND HAZARDOUS MATERIALS (APR 1993)

(a) Definitions. As used in this clause--

(1) "Storage" means a non-transitory, semi-permanent or permanent holding, placement, or leaving of material. It does not include a temporary accumulation of a limited quantity of a material used in or a waste generated or resulting from authorized activities, such as servicing, maintenance, or repair of Department of Defense (DoD) items, equipment, or facilities.

(2) "Toxic or hazardous materials" means:

(i) Materials referred to in section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 U.S.C. 9601(14)) and materials designated under section 102 of CERCLA (42 U.S.C. 9602) (40 CFR Part 302);

(ii) Materials that are of an explosive, flammable, or pyrotechnic nature; or

(iii) Materials otherwise identified by the Secretary of Defense as specified in DoD regulations.

(b) In accordance with 10 U.S.C. 2692, the Contractor is prohibited from storing or disposing of non- DoD-owned toxic or hazardous materials on a DoD installation, except to the extent authorized by a statutory exception to 10 U.S.C. 2692 or as authorized by the Secretary of Defense or his designee.

59. *FAR 52.225-9 BUY AMERICAN ACT—BALANCE OF PAYMENT PROGRAM—CONSTRUCTION MATERIALS (FEB 2000) (For Contracts less than \$6.806 million)

(a) Definitions. As used in this clause—

“Component” means any article, material, or supply incorporated directly into construction materials.

“Construction material” means an article, material, or supply brought to the construction site by the Contractor or a subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

“Cost of components” means—

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the end product (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

“Domestic construction material” means—

(1) An unmanufactured construction material mined or produced in the United States; or

(2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost

of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

“Foreign construction material” means a construction material other than a domestic construction material.

“United States” means the 50 States and the District of Columbia, U.S. territories and possessions, Puerto Rico, the Northern Mariana Islands, and any other place subject to U.S. jurisdiction, but does not include leased bases.

(b) *Domestic preference.* (1) This clause implements the Buy American Act (41 U.S.C. 10a - 10d) and the Balance of Payments Program by providing a preference for domestic construction material. The Contractor shall use only domestic construction material in performing this contract, except as provided in paragraphs (b)(2) and (b)(3) of this clause.

(2) This requirement does not apply to the construction material or components listed by the Government as follows:

[Contracting Officer to list applicable excepted materials or indicate “none”]

(3) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(2) of this clause if the Government determines that—

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the requirements of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent. For determination of unreasonable cost under the Balance of Payments Program, the Contracting Officer will use a factor of 50 percent;

(ii) The application of the restriction of the Buy American Act or Balance of Payments Program to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) *Request for determination of inapplicability of the Buy American Act or Balance of Payments Program.*

(1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(3) of this clause shall include adequate information for Government evaluation of the request, including—

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Price;

(E) Time of delivery or availability;

(F) Location of the construction project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American Act or Balance of Payments Program applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(3)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American Act or Balance of Payments Program applies, use of foreign construction material is non-compliant with the Buy American Act or Balance of Payments Program.

(d) *Data.* To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost,

the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

FOREIGN AND DOMESTIC CONSTRUCTION MATERIALS PRICE COMPARISON			
<u>Construction Material</u> <u>Description</u>	<u>Unit of</u> <u>Measure</u>	<u>Quantity</u>	<u>Price</u> <u>(Dollars)*</u>
<i>Item 1:</i>			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____
<i>Item 2:</i>			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____

60. *FAR 52.225-10 NOTICE OF BUY AMERICAN ACT/BALANCE OF PAYMENTS PROGRAM REQUIREMENT—CONSTRUCTION MATERIALS (FEB 2000) (Applicable with FAR 52.225-9)

(a) *Definitions.* “Construction material,” “domestic construction material,” and “foreign construction material,” as used in this provision, are defined in the clause of this solicitation entitled “Buy American Act—Balance of Payments Program—Construction Materials” (Federal Acquisition Regulation (FAR) clause 52.225-9).

(b) *Requests for determinations of inapplicability.* An offeror requesting a determination regarding the inapplicability of the Buy American Act or Balance of Payments Program should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of the clause at FAR 52.225-9 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American Act or Balance of Payments Program before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) *Evaluation of offers.* (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American Act or Balance of Payments Program, based on claimed unreasonable cost of domestic construction material, by adding to the offered price the appropriate percentage of the cost of such foreign construction material, as specified in paragraph (b)(3)(i) of the clause at FAR 52.225-9.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) *Alternate offers.* (1) When an offer includes foreign construction material not listed by the Government in this solicitation in paragraph (b)(2) of the clause at FAR 52.225-9, the offeror also may submit an alternate offer based on use of equivalent domestic construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of the clause at FAR 52.225-9 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of the clause at FAR 52.225-9 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic construction material, and the offeror shall be required to furnish such domestic construction material. An offer based on use of the foreign construction material for which an exception was requested—

- (i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or
- (ii) May be accepted if revised during negotiations.

(End of provision)

FOREIGN AND DOMESTIC CONSTRUCTION MATERIALS PRICE COMPARISON			
<u>Construction Material Description</u>	<u>Unit of Measure</u>	<u>Quantity</u>	<u>Price (Dollars)*</u>
<i>Item 1:</i>			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____
<i>Item 2:</i>			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____

[List name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.]

[Include other applicable supporting information.]

[Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).]*

(End of clause)

61. *FAR 52.225-11 BUY AMERICAN ACT—BALANCE OF PAYMENTS PROGRAM—CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (FEB 2000) [For Contracts more than \$6,806,000] ALTERNATE I (JUNE 2000) [For Contracts between \$6.806 and 7.068419 Million]

(a) *Definitions.* As used in this clause—

“Component” means any article, material, or supply incorporated directly into construction materials.

“Construction material” means an article, material, or supply brought to the construction site by the Contractor or subcontractor for incorporation into the building or work. The term also includes an item brought to the site pre-assembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

“Cost of components” means—

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the end product (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

“Designated country” means any of the following countries:

Aruba Kiribati
Austria Korea, Republic of
Bangladesh Lesotho
Belgium Liechtenstein
Benin Luxembourg
Bhutan Malawi
Botswana Maldives
Burkina Faso Mali

Burundi Mozambique
Canada Nepal
Cape Verde Netherlands
Central African Niger
Republic
Chad Norway
Comoros Portugal
Denmark Rwanda
Djibouti Sao Tome and Principe
Equatorial Guinea Sierra Leone
Finland Singapore
France Somalia
Gambia Spain
Germany Sweden
Greece Switzerland
Guinea Tanzania U.R.
Guinea-Bissau Togo
Haiti Tuvalu
Hong Kong Uganda
Ireland United Kingdom
Israel Vanuatu
Italy Western Samoa
Japan Yemen

“Designated country construction material” means a construction material that—

- (1) Is wholly the growth, product, or manufacture of a designated country; or
- (2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a designated country into a new and different construction material distinct from the materials from which it was transformed.

“Domestic construction material” means—

- (1) An unmanufactured construction material mined or produced in the United States; or
- (2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

“Foreign construction material” means a construction material other than a domestic construction material.

“North American Free Trade Agreement country” means Canada or Mexico.

“North American Free Trade Agreement country construction material” means a construction material that—

- (1) Is wholly the growth, product, or manufacture of a North American Free Trade Agreement (NAFTA) country; or
- (2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a NAFTA country into a new and different construction material distinct from the materials from which it was transformed.

“United States” means the 50 States and the District of Columbia, U.S. territories and possessions, Puerto Rico, the Northern Mariana Islands, and any other place subject to U.S. jurisdiction, but does not include leased bases.

(b) *Construction materials.* (1) This clause implements the Buy American Act (41 U.S.C. 10a - 10d) and the Balance of Payments Program by providing a preference for domestic construction material. In addition, the Contracting Officer has determined that the Trade Agreements Act and the North American Free Trade Agreement (NAFTA) apply to this acquisition. Therefore, the Buy American Act and Balance of Payments Program restrictions are waived for designated country and NAFTA country construction materials.

(2) The Contractor shall use only domestic, designated country, or NAFTA country construction material in performing this contract, except as provided in paragraphs (b)(3) and (b)(4) of this clause.

(3) The requirement in paragraph (b)(2) of this clause does not apply to the construction materials or components listed by the Government as follows:

[Contracting Officer to list applicable excepted materials or indicate "none"]

(4) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(3) of this clause if the Government determines that—

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the restrictions of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent. For determination of unreasonable cost under the Balance of Payments Program, the Contracting Officer will use a factor of 50 percent;

(ii) The application of the restriction of the Buy American Act or Balance of Payments Program to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) *Request for determination of inapplicability of the Buy American Act or Balance of Payments Program.*
(1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(4) of this clause shall include adequate information for Government evaluation of the request, including—

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Price;

(E) Time of delivery or availability;

(F) Location of the construction project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American Act or Balance of Payments Program applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(4)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American Act or Balance of Payments Program applies, use of foreign construction material is noncompliant with the Buy American Act or Balance of Payments Program.

(d) *Data.* To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

FOREIGN AND DOMESTIC CONSTRUCTION MATERIALS PRICE COMPARISON			
Construction Material Description	Unit of Measure	Quantity	Price (Dollars)*
<i>Item 1:</i>			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____
<i>Item 2:</i>			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____

[List name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.]

[Include other applicable supporting information.]

[Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).]*

(End of clause)

Alternate I (June 2000). As prescribed in 25.1102(c)(3), delete the definitions of “North American Free Trade Agreement country” and “North American Free Trade Agreement country construction material” from the definitions in paragraph (a) of the basic clause and substitute the following paragraphs (b)(1) and (b)(2) for paragraphs (b)(1) and (b)(2) of the basic clause:

(b) *Construction materials.* (1) This clause implements the Buy American Act (41 U.S.C. 10a-10d) and the Balance of Payments Program by providing a preference for domestic construction material. In addition, the Contracting Officer has determined that the Trade Agreements Act applies to this acquisition. Therefore, the Buy American Act and Balance of Payments Program restrictions are waived for designated country construction materials.

(2) The Contractor shall use only domestic or designated country construction material in performing this contract, except as provided in paragraphs (b)(3) and (b)(4) of this clause.

62. *FAR 52.225-12 NOTICE OF BUY AMERICAN ACT/BALANCE OF PAYMENTS PROGRAM REQUIREMENT—CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (FEB 2000)
[Applicable with FAR 52.225-11] ALTERNATE II (June 2000) [For Contracts Between 6.806 and 7.068419 Million]

(a) *Definitions.* “Construction material,” “designated country construction material,” “domestic construction material,” “foreign construction material,” and “NAFTA country construction material,” as used in this provision, are defined in the clause of this solicitation entitled “Buy American Act—Balance of Payments Program—Construction Materials under Trade Agreements” (Federal Acquisition Regulation (FAR) clause 52.225-11).

(b) *Requests for determination of inapplicability.* An offeror requesting a determination regarding the inapplicability of the Buy American Act or Balance of Payments Program should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of FAR clause 52.225-11 in the

request. If an offeror has not requested a determination regarding the inapplicability of the Buy American Act or Balance of Payments Program before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) *Evaluation of offers.* (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American Act or Balance of Payments Program, based on claimed unreasonable cost of domestic construction materials, by adding to the offered price the appropriate percentage of the cost of such foreign construction material, as specified in paragraph (b)(4)(i) of FAR clause 52.225-11.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) *Alternate offers.* (1) When an offer includes foreign construction material, other than designated country or NAFTA country construction material, that is not listed by the Government in this solicitation in paragraph (b)(3) of FAR clause 52.225-11, the offeror also may submit an alternate offer based on use of equivalent domestic, designated country, or NAFTA country construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of FAR clause 52.225-11 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of FAR clause 52.225-11 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic, designated country, or NAFTA country construction material, and the offeror shall be required to furnish such domestic, designated country, or NAFTA country construction material. An offer based on use of the foreign construction material for which an exception was requested—

- (i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or
- (ii) May be accepted if revised during negotiations.

(End of provision)

ALTERNATE II (June 2000) [For Contracts between 6.806 and 7.068419 Million]

As prescribed in 25.1102(d)(3), substitute the following paragraphs (a) and (d) for paragraphs (a) and (d) of the basic provision:

(a) *Definitions.* “Construction material,” “designated country construction material,” “domestic construction material,” and “foreign construction material,” as used in this provision, are defined in the clause of this solicitation entitled “Buy American Act—Balance of Payments Program—Construction Materials under Trade Agreements” (Federal Acquisition Regulation (FAR) clause 52.225-11).

(d) *Alternate offers.* (1) When an offer includes foreign construction material, other than designated country construction material, that is not listed by the Government in this solicitation in paragraph (b)(3) of FAR clause 52.225-11, the offeror also may submit an alternate offer based on use of equivalent domestic or designated country construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of FAR clause 52.225-11 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of FAR clause 52.225-11 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic or designated country construction material, and the offeror shall be required to furnish such domestic or designated country construction material. An offer based on use of the foreign construction material for which an exception was requested—

- (i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or
- (ii) May be accepted if revised during negotiations.

63. *FAR 52.225-13 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (JULY 2000)

(a) The Contractor shall not acquire, for use in the performance of this contract, any supplies or services originating from sources within, or that were located in or transported from or through, countries whose products are banned from importation into the United States under regulations of the Office of Foreign Assets Control, Department of the Treasury. Those countries are Cuba, Iran, Iraq, Libya, North Korea, Sudan, the territory of Afghanistan controlled by the Taliban, and Serbia (excluding the territory of Kosovo).

(b) The Contractor shall not acquire for use in the performance of this contract any supplies or services from entities controlled by the government of Iraq.

(c) The Contractor shall insert this clause, including this paragraph (c), in all subcontracts.
(End of clause)

64. DFARS 252.226-7001 UTILIZATION OF INDIAN ORGANIZATIONS AND INDIAN-OWNED ECONOMIC ENTERPRISES--DOD CONTRACTS (SEP 2001)

(a) *Definitions.* As used in this clause--

"Indian" means any person who is a member of any Indian tribe, band, group, pueblo, or community that is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs (BIA) in accordance with 25 U.S.C. 1452(c) and any "Native" as defined in the Alaska Native Claims Settlement Act (43 U.S.C. 1601).

"Indian organization" means the governing body of any Indian tribe or entity established or recognized by the governing body of an Indian tribe for the purposes of 25 U.S.C. Chapter 17.

"Indian-owned economic enterprise" means any Indian-owned (as determined by the Secretary of the Interior) commercial, industrial, or business activity established or organized for the purpose of profit, provided that Indian ownership constitutes not less than 51 percent of the enterprise.

"Indian tribe" means any Indian tribe, band, group, pueblo, or community, including native villages and native groups (including corporations organized by Kenai, Juneau, Sitka, and Kodiak) as defined in the Alaska Native Claims Settlement Act, that is recognized by the Federal Government as eligible for services from BIA in accordance with 25 U.S.C. 1452(c).

"Interested party" means a contractor or an actual or prospective offeror whose direct economic interest would be affected by the award of a subcontract or by the failure to award a subcontract.

(b) The Contractor shall use its best efforts to give Indian organizations and Indian-owned economic enterprises the maximum practicable opportunity to participate in the subcontracts it awards, to the fullest extent consistent with efficient performance of the contract.

(c) The Contracting Officer and the Contractor, acting in good faith, may rely on the representation of an Indian organization or Indian-owned economic enterprise as to its eligibility, unless an interested party challenges its status or the Contracting Officer has independent reason to question that status.

(d) In the event of a challenge to the representation of a subcontractor, the Contracting Officer will refer the matter to the--

U.S. Department of the Interior
Bureau of Indian Affairs
Attn: Chief, Division of Contracting and
Grants Administration
1849 C Street NW, MS-2626-MIB
Washington, DC 20240-4000.

The BIA will determine the eligibility and will notify the Contracting Officer. No incentive payment will be made--

- (1) Within 50 working days of subcontract award;
- (2) While a challenge is pending; or
- (3) If a subcontractor is determined to be an ineligible participant.

(e)(1) The Contractor, on its own behalf or on behalf of a subcontractor at any tier, may request an adjustment under the Indian Incentive Program to the following:

- (i) The estimated cost of a cost-type contract.
- (ii) The target cost of a cost-plus-incentive-fee contract.
- (iii) The target cost and ceiling price of a fixed-price incentive contract.
- (iv) The price of a firm-fixed-price contract.

(2) The amount of the adjustment that may be made to the contract is 5 percent of the estimated cost, target cost, or firm-fixed price included in the subcontract initially awarded to the Indian organization or Indian-owned economic enterprise.

(3) The Contractor has the burden of proving the amount claimed and must assert its request for an adjustment prior to completion of contract performance.

(4) The Contracting Officer, subject to the terms and conditions of the contract and the availability of funds, will authorize an incentive payment of 5 percent of the amount paid to the subcontractor.

(5) If the Contractor requests and receives an adjustment on behalf of a subcontractor, the Contractor is obligated to pay the subcontractor the adjustment.

(f) The Contractor shall insert the substance of this clause, including this paragraph (f), in all subcontracts that--

(1) Are for other than commercial items; and

(2) Are expected to exceed the simplified acquisition threshold in Part 2 of the Federal Acquisition

Regulation.

(End of clause)

65. *FAR 52.227-1

AUTHORIZATION AND CONSENT (JUL 1995)

(a) The Government authorizes and consents to all use and manufacture, in performing this contract or any subcontract at any tier, of any invention described in and covered by a United States patent

(1) embodied in the structure or composition of any article the delivery of which is accepted by the Government under this contract or

(2) used in machinery, tools, or methods whose use necessarily results from compliance by the Contractor or a subcontractor with

(i) specifications or written provisions forming a part of this contract or

(ii) specific written instructions given by the Contracting Officer directing the manner of performance. The entire liability to the Government for infringement of a patent of the United States shall be determined solely by the provisions of the indemnity clause, if any, included in this contract or any subcontract hereunder (including any lower-tier subcontract), and the Government assumes liability for all other infringement to the extent of the authorization and consent hereinabove granted.

(b) The Contractor agrees to include, and require inclusion of, this clause, suitably modified to identify the parties, in all subcontracts at any tier for supplies or services (including construction, architect-engineer services, and materials, supplies, models, samples, and design or testing services expected to exceed the simplified acquisition threshold) however, omission of this clause from any subcontract, including those at or below the simplified acquisition threshold, does not affect this authorization and consent.

66. *FAR 52.227-2

NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG 1996)

(a) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail, each notice or claim of patent or copy-right infringement based on the performance of this contract of which the Contractor has knowledge.

(b) In the event of any claim or suit against the Government on account of any alleged patent or copyright infringement arising out of the performance of this contract or out of the use of any supplies furnished or work or services performed under this contract, the Contractor shall furnish to the Government, when requested by the Contracting Officer, all evidence and information in possession of the Contractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the Government except where the Contractor has agreed to indemnify the Government.

(c) The Contractor agrees to include, and require inclusion of, this clause in all subcontracts at any tier for supplies or services (including construction and architect-engineer subcontracts and those for material, supplies, models, samples, or design or testing services) expected to exceed the simplified acquisition threshold at FAR 2.101.

67. *FAR 52.227-4 PATENT INDEMNITY--CONSTRUCTION CONTRACTS (APR 1984)

Except as otherwise provided, the Contractor agrees to indemnify the Government and its officers, agents, and employees against liability, including costs and expenses, for infringement upon any United States patent (except a patent issued upon an application that is now or may hereafter be withheld from issue pursuant to a Secrecy Order under 35 U.S.C. 181) arising out of performing this contract or out of the use or disposal by or for the account of the Government of supplies furnished or work performed under this contract.

68. DFARS 252.227-7022 GOVERNMENT RIGHTS (UNLIMITED) (MAR 1979)

The Government shall have unlimited rights, in all drawings, designs, specifications, notes and other works developed in the performance of this contract, including the right to use same on any other Government design or construction without additional compensation to the Contractor. The Contractor hereby grants to the Government a paid-up license throughout the world to all such works to which he may assert or establish any claim under design patent or copyright laws. The Contractor for a period of three (3) years after completion of the project agrees to furnish the original or copies of all such works on the request of the Contracting Officer. (End of clause)

69. DFARS 252.227-7023 DRAWINGS AND OTHER DATA TO BECOME PROPERTY OF GOVERNMENT (MAR 1979)

All designs, drawings, specifications, notes and other works developed in the performance of this contract shall become the sole property of the Government and may be used on any other design or construction without additional compensation to the Contractor. The Government shall be considered the "person for whom the work was prepared" for the purpose of authorship in any copyrightable

70. DFARS 252.227-7033 RIGHTS IN SHOP DRAWINGS (APR 1966)

(a) Shop drawings for construction means drawings, submitted to the Government by the Construction Contractor, subcontractor or any lower-tier subcontractor pursuant to a construction contract, showing in detail

(i) the proposed fabrication and assembly of structural elements and (ii) the installation (i.e., form, fit, and attachment details) of materials or equipment. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(b) This clause, including this paragraph (b), shall be included in all subcontracts hereunder at any tier.

71. *FAR 52.228-2 ADDITIONAL BOND SECURITY (OCT 1997)

The Contractor shall promptly furnish additional security required to protect the Government and persons supplying labor or materials under this contract if--

(a) Any surety upon any bond, or issuing financial institution for other security, furnished with this contract becomes unacceptable to the Government;

(b) Any surety fails to furnish reports on its financial condition as required by the Government;

(c) The contract price is increased so that the penal sum of any bond becomes inadequate in the opinion of the Contracting Officer; or

(d) An irrevocable letter of credit (ILC) used as security will expire before the end of the period of required security. If the Contractor does not furnish an acceptable extension or replacement ILC, or other acceptable substitute, at least 30 days before an ILC's scheduled expiration, the Contracting Officer has the right to immediately draw on the ILC.

72. *FAR 52.228-5 INSURANCE--WORK ON A GOVERNMENT INSTALLATION (JAN 1997) [For Contracts Exceeding \$100,000]

(a) The Contractor shall, at its own expense, provide and maintain during the entire performance of this contract, at least the kinds and minimum amounts of insurance required in the Schedule or elsewhere in the contract.

(b) Before commencing work under this contract, the Contractor shall notify the Contracting Officer in writing that the required insurance has been obtained. The policies evidencing required insurance shall contain an endorsement to the effect that any cancellation or any material change adversely affecting the Government's interest shall not be effective

(1) for such period as the laws of the State in which this contract is to be performed prescribe, or

(2) until 30 days after the insurer or the Contractor gives written notice to the Contracting Officer, whichever period is longer.

(c) The Contractor shall insert the substance of this clause, including this paragraph (c), in subcontracts under this contract that require work on a Government installation and shall require subcontractors to provide and maintain the insurance required in the Schedule or elsewhere in the contract. The Contractor shall maintain a copy of all subcontractors' proofs of required insurance, and shall make copies available to the Contracting Officer upon request.

73. *FAR 52.228-11 PLEDGES OF ASSETS (FEB 1992)

(a) Offerors shall obtain from each person acting as an individual surety on a bid guarantee, a performance bond, or a payment bond--

(1) Pledge of assets; and

(2) Standard Form 28, Affidavit of Individual Surety.

(b) Pledges of assets from each person acting as an individual surety shall be in the form of--

(1) Evidence of an escrow account containing cash, certificates of deposit, commercial or Government securities, or other assets described in FAR 28.203-2 (except see 28.203-2(b)(2) with respect to Government securities held in book entry form) and/or;

(2) A recorded lien on real estate. The offeror will be required to provide--

(i) Evidence of title in the form of a certificate of title prepared by a title insurance company approved by the United States Department of Justice. This title evidence must show fee simple title vested in the surety along with any concurrent owners; whether any real estate taxes are due and payable; and any recorded encumbrances against the property, including the lien filed in favor of the Government as required by FAR 28.203-3(d);

(ii) Evidence of the amount due under any encumbrance shown in the evidence of title;

(iii) A copy of the current real estate tax assessment of the property or a current appraisal dated no earlier than 6 months prior to the date of the bond, prepared by a professional appraiser who certifies that the appraisal has been conducted in accordance with the generally accepted appraisal standards as reflected in the Uniform Standards of Professional Appraisal Practice, as promulgated by the Appraisal Foundation.

74. *FAR 52.228-12 PROSPECTIVE SUBCONTRACTOR REQUESTS FOR BONDS (OCT 1995)

In accordance with Section 806(a)(3) of Public Law 102-190, as amended by Sections 2091 and 8105 of Pub. L. 103-355, upon the request of a prospective subcontractor or supplier offering to furnish labor or material for the performance of this contract for which a payment bond has been furnished to the Government pursuant to the Miller Act, the Contractor shall promptly provide a copy of such payment bond to the requestor.

75. FAR 52.228-14 IRREVOCABLE LETTER OF CREDIT (DEC 1999)

(a) "Irrevocable letter of credit" (ILC), as used in this clause, means a written commitment by a federally insured financial institution to pay all or part of a stated amount of money, until the expiration date of the letter, upon presentation by the Government (the beneficiary) of a written demand therefor. Neither the financial institution nor the offeror/Contractor can revoke or condition the letter of credit.

(b) If the offeror intends to use an ILC in lieu of a bid bond, or to secure other types of bonds such as performance and payment bonds, the letter of credit and letter of confirmation formats in paragraphs (e) and (f) of this clause shall be used.

(c) The letter of credit shall be irrevocable, shall require presentation of no document other than a written demand and the ILC (including confirming letter, if any), shall be issued/confirmed by an acceptable federally insured financial institution as provided in paragraph (d) of this clause, and --

(1) If used as a bid guarantee, the ILC shall expire no earlier than 60 days after the close of the bid acceptance period;

(2) If used as an alternative to corporate or individual sureties as security for a performance or payment bond, the offeror/Contractor may submit an ILC to cover the entire period of performance or may submit an ILC with an initial expiration date estimated to cover the entire period for which financial security is required or may submit an ILC with an initial expiration that is a minimum period of one year from the date of issuance. The ILC shall provide that, unless the issuer provides the beneficiary written notice of non-renewal of least 60 days in advance of the current expiration date, the ILC is automatically extended without amendment for one year from the expiration date, or any future expiration date, until the period of required coverage is completed and the Contracting Officer provides the financial institution with a written statement waiving the right to payment. The period of required coverage shall be:

(i) For contracts subject to the Miller Act, the later of--

(A) One year following the expected date of final payment;

(B) For performance bonds only, until completion of any warranty period; or

(C) For payment bonds only, until resolution of all claims filed against the

payment bond during the one-year period following final payment.

(ii) For contracts not subject to the Miller Act, the later of--

(A) 90 days following final payment; or

(B) For performance bonds only, until completion of any warranty period.

(d) Only federally insured financial institution rated investment grade or higher shall issue or confirm the ILC. The offeror/Contractor shall provide the Contracting Officer a credit rating that indicates the financial institution has the required rating(s) as of the date of issuance of the ILC. Unless the financial institution issuing the ILC had letter of credit business of at least \$25 million in the past year, ILCs over \$5 million must be confirmed by another acceptable financial institution that had letter of credit business of at least \$25 million in the past year.

(e) The following format shall be used by the issuing financial institution to create an ILC:

[Issuing Financial Institution's Letterhead or Name and Address]

Issue Date -----

Irrevocable Letter of Credit No.-----

Account party's name-----

Account party's address-----

For Solicitation No.-----

(For reference only)

TO: [U.S. Government agency]
[U.S. Government agency's address]

1. We hereby establish this irrevocable and transferable Letter of Credit in your favor for one or more drawings up to United States \$ _____. This Letter of Credit is payable at [issuing financial institution's and, if any, confirming financial institution's] office at [issuing financial institution's address and, if any, confirming financial institution's address] and expires with our close of business on _____, or any automatically extended expiration date.

2. We hereby undertake to honor your or transferee's sight draft(s) drawn on issuing or, if any, the confirming financial institution, for all or any part of this credit if presented with this Letter of Credit and confirmation, if any, at the office specified in paragraph 1 of this Letter of Credit on or before the expiration date or any automatically extended expiration date.

3. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this Letter of Credit that it is deemed to be automatically extended without amendment for one year from the expiration date hereof, or any future expiration date, unless at least 60 days prior to any expiration date, we notify you or the transferee by registered mail, or other receipted means of delivery, that we elect not to consider this Letter of Credit renewed for any such additional period. At the time we notify you, we also agree to notify the account party (and confirming financial institution, if any) by the same means of delivery.

4. This Letter of Credit is transferable. Transfers and assignments of proceeds are to be effected without charge to either the beneficiary or the transferee/assignee of proceeds. Such transfer or assignment shall be only at the written direction of the Government (the beneficiary) in a form satisfactory to the issuing financial institution and the confirming financial institution, if any.

5. This Letter of Credit is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent therewith, to the laws of _____ [state of confirming financial institution, if any, otherwise state of issuing financial institution].

6. If this credit expires during an interruption of business of this financial institution as described in Article 17 of the UCP, the financial institution specifically agrees to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

[Issuing financial institution]

(f) The following format shall be used by the financial institution to confirm an ILC:

[Confirming Financial Institution's Letterhead or Name and Address] ---

(Date) _____

Our Letter of Credit

Advice Number-----

Beneficiary:-----

[U.S. Government agency]

Issuing Financial Institution:-----

Issuing Financial Institution's LC No.:-----

Gentlemen:

1. We hereby confirm the above indicated Letter of Credit, the original of which is attached, issued by _____ [name of issuing financial institution] for drawings of up to United States dollars _____/U.S. \$ _____ and expiring with our close of business on _____ [the expiration date], or any automatically extended expiration date.

2. Draft(s) drawn under the Letter of Credit and this Confirmation are payable at our office located at _____.

3. We hereby undertake to honor sight draft(s) drawn under and presented with the Letter of Credit and this Confirmation at our offices as specified herein.

4. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this confirmation that it be deemed automatically extended without amendment for one year from the expiration date hereof, or any automatically extended expiration date, unless:

(a) At least 60 days prior to any such expiration date, we shall notify the Contracting Officer, or the transferee and the issuing financial institution, by registered mail or other receipted means of delivery, that we elect not to consider this confirmation extended for any such additional period; or

(b) The issuing financial institution shall have exercised its right to notify you or the transferee, the account party, and ourselves, of its election not to extend the expiration date of the Letter of Credit.

5. This confirmation is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent therewith, to the laws of _____ [state of confirming financial institution].

6. If this confirmation expires during an interruption of business of this financial institution as described in Article 17 of the UCP, we specifically agree to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

[Confirming financial institution]

(g) The following format shall be used by the Contracting Officer for a sight draft to draw on the Letter of Credit:
SIGHT DRAFT

[City, State]

(Date) _____

[Name and address of financial institution]

Pay to the order of-----

[Beneficiary Agency] _____

the sum of United States \$ _____

This draft is drawn under-----

Irrevocable Letter of Credit No.-----

[Beneficiary Agency]

By: _____

76. *FAR 52.228-15 PERFORMANCE AND PAYMENT BONDS (JULY 2000)

(a) *Definitions.* As used in this clause—

“Original contract price” means the award price of the contract; or, for requirements contracts, the price payable for the estimated total quantity; or, for indefinite-quantity contracts, the price payable for the specified minimum quantity. Original contract price does not include the price of any options, except those options exercised at the time of contract award.

(b) *Amount of required bonds.* Unless the resulting contract price is \$100,000 or less, the successful offeror shall furnish performance and payment bonds to the Contracting Officer as follows:

(1) *Performance bonds (Standard Form 25).* The penal amount of performance bonds at the time of contract award shall be 100 percent of the original contract price.

(2) *Payment Bonds (Standard Form 25-A).* The penal amount of payment bonds at the time of contract award shall be 100 percent of the original contract price.

(3) *Additional bond protection.* (i) The Government may require additional performance and

payment bond protection if the contract price is increased. The increase in protection generally will equal 100 percent of the increase in contract price.

(ii) The Government may secure the additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(c) *Furnishing executed bonds.* The Contractor shall furnish all executed bonds, including any necessary reinsurance agreements, to the Contracting Officer, within the time period specified in the Bid Guarantee provision of the solicitation, or otherwise specified by the Contracting Officer, but in any event, before starting work.

(d) *Surety or other security for bonds.* The bonds shall be in the form of firm commitment, supported by corporate sureties whose names appear on the list contained in Treasury Department Circular 570, individual sureties, or by other acceptable security such as postal money order, certified check, cashier's check, irrevocable letter of credit, or, in accordance with Treasury Department regulations, certain bonds or notes of the United States. Treasury Circular 570 is published in the Federal Register or may be obtained from the:

U.S. Department of Treasury
Financial Management Service
Surety Bond Branch
401 14th Street, NW, 2nd Floor, West Wing
Washington, DC 20227.

(e) *Notice of subcontractor waiver of protection (40 U.S.C. 270b(c)).* Any waiver of the right to sue on the payment bond is void unless it is in writing, signed by the person whose right is waived, and executed after such person has first furnished labor or material for use in the performance of the contract.
(End of clause)

77. FAR 52.229-3 FEDERAL, STATE, AND LOCAL TAXES (JAN 1991) [For Contracts Exceeding \$100,000]

(a) "Contract date," as used in this clause, means the date set for bid opening or, if this is a negotiated contract or a modification, the effective date of this contract or modification.

"All applicable Federal, State, and local taxes and duties," as used in this clause, means all taxes and duties, in effect on the contract date, that the taxing authority is imposing and collecting on the transactions or property covered by this contract.

"After-imposed Federal tax," as used in this clause, means any new or increased Federal excise tax or duty, or tax that was exempted or excluded on the contract date but whose exemption was later revoked or reduced during the contract period, on the transactions or property covered by this contract that the Contractor is required to pay or bear as the result of legislative, judicial, or administrative action taking effect after the contract date. It does not include social security tax or other employment taxes.

"After-relieved Federal tax," as used in this clause, means any amount of Federal excise tax or duty, except social security or other employment taxes, that would otherwise have been payable on the transactions or property covered by this contract, but which the Contractor is not required to pay or bear, or for which the Contractor obtains a refund or drawback, as the result of legislative, judicial, or administrative action taking effect after the contract date.

(b) The contract price includes all applicable Federal, State, and local taxes and duties.

(c) The contract price shall be increased by the amount of any after-imposed Federal tax, provided the Contractor warrants in writing that no amount for such newly imposed Federal excise tax or duty or rate increase was included in the contract price, as a contingency reserve or otherwise.

(d) The contract price shall be decreased by the amount of any after-relieved Federal tax.

(e) The contract price shall be decreased by the amount of any Federal excise tax or duty, except social security or other employment taxes, that the Contractor is required to pay or bear, or does not obtain a refund of, through the Contractor's fault, negligence, or failure to follow instructions of the Contracting Officer.

(f) No adjustment shall be made in the contract price under this clause unless the amount of the adjustment exceeds \$250.

(g) The Contractor shall promptly notify the Contracting Officer of all matters relating to any Federal excise tax or duty that reasonably may be expected to result in either an increase or decrease in the contract price and shall take appropriate action as the Contracting Officer directs.

(h) The Government shall, without liability, furnish evidence appropriate to establish exemption from any Federal, State, or local tax when the Contractor requests such evidence and a reasonable basis exists to sustain the exemption.

78. FAR 52.229-5 TAXES--CONTRACTS PERFORMED IN U.S. POSSESSIONS OR PUERTO RICO (APR 1984)

The term "local taxes," as used in the Federal, State, and local taxes clause of this contract, includes taxes imposed by a possession of the United States or by Puerto Rico.

79. FAR 52.230-1 COST ACCOUNTING STANDARDS NOTICES AND CERTIFICATION (JUNE 2000)

Note: This notice does not apply to small businesses or foreign governments. This notice is in three parts, identified by Roman numerals I through III.

Offerors shall examine each part and provide the requested information in order to determine Cost Accounting Standards (CAS) requirements applicable to any resultant contract.

If the offeror is an educational institution, Part II does not apply unless the contemplated contract will be subject to full or modified CAS coverage pursuant to 48 CFR 9903.201-2(c)(5) or 9903.201-2(c)(6), respectively.

I. DISCLOSURE STATEMENT--COST ACCOUNTING PRACTICES AND CERTIFICATION

(a) Any contract in excess of \$500,000 resulting from this solicitation will be subject to the requirements of the Cost Accounting Standards Board (48 CFR Chapter 99), except for those contracts which are exempt as specified in 48 CFR 9903.201-1.

(b) Any offeror submitting a proposal which, if accepted, will result in a contract subject to the requirements of 48 CFR Chapter 99 must, as a condition of contracting, submit a Disclosure Statement as required by 48 CFR 9903.202. When required, the Disclosure Statement must be submitted as a part of the offeror's proposal under this solicitation unless the offeror has already submitted a Disclosure Statement disclosing the practices used in connection with the pricing of this proposal. If an applicable Disclosure Statement has already been submitted, the offeror may satisfy the requirement for submission by providing the information requested in paragraph (c) of Part I of this provision.

CAUTION: In the absence of specific regulations or agreement, a practice disclosed in a Disclosure Statement shall not, by virtue of such disclosure, be deemed to be a proper, approved, or agreed-to practice for pricing proposals or accumulating and reporting contract performance cost data.

(c) Check the appropriate box below:

☐ (1) Certificate of Concurrent Submission of Disclosure Statement

The offeror hereby certifies that, as a part of the offer, copies of the Disclosure Statement have been submitted as follows: (i) original and one copy to the cognizant Administrative Contracting Officer (ACO) or cognizant Federal agency official authorized to act in that capacity (Federal official), as applicable, and (ii) one copy to the cognizant Federal auditor.

(Disclosure must be on Form No. CASB DS-1 or CASB DS-2, as applicable. Forms may be obtained from the cognizant ACO or Federal official and/or from the loose-leaf version of the Federal Acquisition Regulation.)

Date of Disclosure Statement: _____

Name and Address of Cognizant ACO or Federal Official Where Filed:

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the Disclosure Statement.

☐ (2) Certificate of Previously Submitted Disclosure Statement.

The offeror hereby certifies that the required Disclosure Statement was filed as follows:

Date of Disclosure Statement: _____

Name and Address of Cognizant ACO or Federal Official Where Filed:

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the applicable Disclosure Statement.

☐ (3) Certificate of Monetary Exemption.

The offeror hereby certifies that the offeror, together with all divisions, subsidiaries, and affiliates under common control, did not receive net awards of negotiated prime contracts and subcontracts subject to CAS totaling \$50 million or more in the cost accounting period immediately preceding the period in which this proposal was submitted. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

☐ (4) Certificate of Interim Exemption.

The offeror hereby certifies that (i) the offeror first exceeded the monetary exemption for disclosure, as defined in (3) of this subsection, in the cost accounting period immediately preceding the period in which this offer was submitted and (ii) in accordance with 48 CFR 9903.202-1, the offeror is not yet required to submit a Disclosure Statement. The offeror further certifies that if an award resulting from this proposal has not been made within 90 days after the end of that period, the offeror will immediately submit a revised certificate to the Contracting Officer, in the form specified under subparagraph (c)(1) or (c)(2) of Part I of this provision, as appropriate, to verify submission of a completed Disclosure Statement.

CAUTION: Offerors currently required to disclose because they were awarded a CAS-covered prime contract or subcontract of \$50 million or more in the current cost accounting period may not claim this exemption (4). Further, the exemption applies only in connection with proposals submitted before expiration of the 90-day period following the cost accounting period in which the monetary exemption was exceeded.

II. COST ACCOUNTING STANDARDS--ELIGIBILITY FOR MODIFIED CONTRACT COVERAGE

If the offeror is eligible to use the modified provisions of 48 CFR 9903.201-2(b) and elects to do so, the offeror shall indicate by checking the box below. Checking the box below shall mean that the resultant contract is subject to the Disclosure and Consistency of Cost Accounting Practices clause in lieu of the Cost Accounting Standards clause.

☐ The offeror hereby claims an exemption from the Cost Accounting Standards clause under the provisions of 48 CFR 9903.201-2(b) and certifies that the offeror is eligible for use of the Disclosure and Consistency of Cost Accounting Practices clause because during the cost accounting period immediately preceding the period in which this proposal was submitted, the offeror received less than \$50 million in awards of CAS-covered prime contracts and subcontracts. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

CAUTION: An offeror may not claim the above eligibility for modified contract coverage if this proposal is expected to result in the award of a CAS-covered contract of \$50 million or more or if, during its current cost

accounting period, the offeror has been awarded a single CAS-covered prime contract or subcontract of \$50 million or more.

III. ADDITIONAL COST ACCOUNTING STANDARDS APPLICABLE TO EXISTING CONTRACTS

The offeror shall indicate below whether award of the contemplated contract would, in accordance with subparagraph (a)(3) of the Cost Accounting Standards clause, require a change in established cost accounting practices affecting existing contracts and subcontracts.

☐ YES ☐ NO
(End of provision)

80. *FAR 52.230-2 COST ACCOUNTING STANDARDS (APR 1998)

(a) Unless the contract is exempt under 48 CFR 9903.201-1 and 9903.201-2, the provisions of 48 CFR Part 9903 are incorporated herein by reference and the Contractor, in connection with this contract, shall --

(1) (CAS-covered Contracts Only) By submission of a Disclosure Statement, disclose in writing the Contractor's cost accounting practices as required by 48 CFR 9903.202-1 through 9903.202-5, including methods of distinguishing direct costs from indirect costs and the basis used for allocating indirect costs. The practices disclosed for this contract shall be the same as the practices currently disclosed and applied on all other contracts and subcontracts being performed by the Contractor and which contain a Cost Accounting Standards (CAS) clause. If the Contractor has notified the Contracting Officer that the Disclosure Statement contains trade secrets and commercial or financial information which is privileged and confidential, the Disclosure Statement shall be protected and shall not be released outside of the Government.

(2) Follow consistently the Contractor's cost accounting practices in accumulating and reporting contract performance cost data concerning this contract. If any change in cost accounting practices is made for the purposes of any contract or subcontract subject to CAS requirements, the change must be applied prospectively to this contract and the Disclosure Statement must be amended accordingly. If the contract price or cost allowance of this contract is affected by such changes, adjustment shall be made in accordance with subparagraph (a)(4) or (a)(5) of this clause, as appropriate.

(3) Comply with all CAS, including any modifications and interpretations indicated thereto contained in 48 CFR Part 9904, in effect on the date of award of this contract or, if the Contractor has submitted cost or pricing data, on the date of final agreement on price as shown on the Contractor's signed certificate of current cost or pricing data. The Contractor shall also comply with any CAS (or modifications to CAS) which hereafter become applicable to a contract or subcontract of the Contractor. Such compliance shall be required prospectively from the date of applicability to such contract or subcontract.

(4)(i) Agree to an equitable adjustment as provided in the Changes clause of this contract if the contract cost is affected by a change which, pursuant to subparagraph (a)(3) of this clause, the Contractor is required to make to the Contractor's established cost accounting practices.

(ii) Negotiate with the Contracting Officer to determine the terms and conditions under which a change may be made to a cost accounting practice, other than a change made under other provisions of subparagraph (a)(4) of this clause; provided that no agreement may be made under this provision that will increase costs paid by the United States.

(iii) When the parties agree to a change to a cost accounting practice, other than a change under subdivision (a)(4)(i) of this clause, negotiate an equitable adjustment as provided in the Changes clause of this contract.

(5) Agree to an adjustment of the contract price or cost allowance, as appropriate, if the Contractor or a subcontractor fails to comply with an applicable Cost Accounting Standard, or to follow any cost accounting practice consistently and such failure results in any increased costs paid by the United States. Such adjustment shall

provide for recovery of the increased costs to the United States, together with interest thereon computed at the annual rate established under section 6621 of the Internal Revenue Code of 1986 (26 U.S.C. 6621) for such period, from the time the payment by the United States was made to the time the adjustment is effected. In no case shall the Government recover costs greater than the increased cost to the Government, in the aggregate, on the relevant contracts subject to the price adjustment, unless the Contractor made a change in its cost accounting practices of which it was aware or should have been aware at the time of price negotiations and which it failed to disclose to the Government.

(b) If the parties fail to agree whether the Contractor or a subcontractor has complied with an applicable CAS in 48 CFR 9904 or a CAS rule or regulation in 48 CFR 9903 and as to any cost adjustment demanded by the United States, such failure to agree will constitute a dispute under the Contract Disputes Act (41 U.S.C. 601).

(c) The Contractor shall permit any authorized representatives of the Government to examine and make copies of any documents, papers, or records relating to compliance with the requirements of this clause.

(d) The Contractor shall include in all negotiated subcontracts which the Contractor enters into, the substance of this clause, except paragraph (b), and shall require such inclusion in all other subcontracts, of any tier, including the obligation to comply with all CAS in effect on the subcontractor's award date or if the subcontractor has submitted cost or pricing data, on the date of final agreement on price as shown on the subcontractor's signed Certificate of Current Cost or Pricing Data. If the subcontract is awarded to a business unit which pursuant to 48 CFR 9903.201-2 is subject to other types of CAS coverage, the substance of the applicable clause set forth in subsection 30.201-4 of the Federal Acquisition Regulation shall be inserted. This requirement shall apply only to negotiated subcontracts in excess of \$500,000, except that the requirement shall not apply to negotiated subcontracts otherwise exempt from the requirement to include a CAS clause as specified in 48 CFR 9903.201-1.

(End of clause)

81. *FAR 52.230-3 DISCLOSURE AND CONSISTENCY OF COST ACCOUNTING PRACTICES (APR 1998)

(a) The Contractor, in connection with this contract, shall --

(1) Comply with the requirements of 48 CFR 9904.401, Consistency in Estimating, Accumulating, and Reporting Costs; 48 CFR 9904.402, Consistency in Allocating Costs Incurred for the Same Purpose; 48 CFR 9904.405, Accounting for Unallowable Costs; and 48 CFR 9904.406, Cost Accounting Standard--Cost Accounting Period, in effect on the date of award of this contract as indicated in 48 CFR Part 9904.

(2) (CAS-covered Contracts Only) If it is a business unit of a company required to submit a Disclosure Statement, disclose in writing its cost accounting practices as required by 48 CFR 9903.202-1 through 9903.202-5. If the Contractor has notified the Contracting Officer that the Disclosure Statement contains trade secrets and commercial or financial information which is privileged and confidential, the Disclosure Statement shall be protected and shall not be released outside of the Government.

(3)(i) Follow consistently the Contractor's cost accounting practices. A change to such practices may be proposed, however, by either the Government or the Contractor, and the Contractor agrees to negotiate with the Contracting Officer the terms and conditions under which a change may be made. After the terms and conditions under which the change is to be made have been agreed to, the change must be applied prospectively to this contract, and the Disclosure Statement, if affected, must be amended accordingly.

(ii) The Contractor shall, when the parties agree to a change to a cost accounting practice and the Contracting Officer has made the finding required in 48 CFR 9903.201 -6(b), that the change is desirable and not detrimental to the interests of the Government, negotiate an equitable adjustment as provided in the Changes clause of this contract. In the absence of the required finding, no agreement may be made under this contract clause that will increase costs paid by the United States.

(4) Agree to an adjustment of the contract price or cost allowance, as appropriate, if the Contractor or a subcontractor fails to comply with the applicable CAS or to follow any cost accounting practice, and such failure results in any increased costs paid by the United States. Such adjustment shall provide for recovery of the increased costs to the United States together with interest thereon computed at the annual rate of interest established

under the Internal Revenue Code of 1986 (26 U.S.C. 6621), from the time the payment by the United States was made to the time the adjustment is effected.

(b) If the parties fail to agree whether the Contractor has complied with an applicable CAS, rule, or regulation as specified in 48 CFR 9903 and 9904 and as to any cost adjustment demanded by the United States, such failure to agree will constitute a dispute under the Contract Disputes Act (41 U.S.C. 601).

(c) The Contractor shall permit any authorized representatives of the Government to examine and make copies of any documents, papers, and records relating to compliance with the requirements of this clause.

(d) The Contractor shall include in all negotiated subcontracts, which the Contractor enters into, the substance of this clause, except paragraph (b), and shall require such inclusion in all other subcontracts of any tier, except that--

(1) If the subcontract is awarded to a business unit which pursuant to 48 CFR 9903.201-2 is subject to other types of CAS coverage, the substance of the applicable clause set forth in subsection 30.201-4 of the Federal Acquisition Regulation shall be inserted.

(2) This requirement shall apply only to negotiated subcontracts in excess of \$500,000.

(3) The requirement shall not apply to negotiated subcontracts otherwise exempt from the requirement to include a CAS clause as specified in 48 CFR 9903.201-1.

(End of clause)

82. DFARS 252.231-7000 SUPPLEMENTAL COST PRINCIPLES (DEC 1991)

When the allowability of costs under this contract is determined in accordance with part 31 of the Federal Acquisition Regulation (FAR) allowability shall also be determined in accordance with part 231 of the DoD FAR Supplement, in effect on the date of this contract.

83. *FAR 52.232-5 PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (MAY 1997)

(a) Payment of Price. The Government shall pay the Contractor the contract price as provided in this contract.

(b) Progress Payments. The Government shall make progress payments monthly as the work proceeds, or at more frequent intervals as determined by the Contracting Officer, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer.

(1) The Contractor's request for progress payments shall include the following substantiation:

(i) An itemization of the amounts requested, related to the various elements of work required by the contract covered by the payment requested.

(ii) A listing of the amount included for work performed by each subcontractor under the contract.

(iii) A listing of the total amount of each subcontract under the contract.

(iv) A listing of the amounts previously paid to each such subcontractor under the contract.

(v) Additional supporting data in a form and detail required by the Contracting Officer.

(2) In the preparation of estimates, the Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration. Material delivered to the Contractor at locations other than the site also may be taken into consideration if--

(i) Consideration is specifically authorized by this contract; and

(ii) The Contractor furnishes satisfactory evidence that it has acquired title to such material and that the material will be used to perform this contract.

(c) Contractor Certification. Along with each request for progress payments, the Contractor shall furnish the following certification, or payment shall not be made: (However, if the Contractor elects to delete paragraph

(c)(4) from the certification, the certification is still acceptable.) I hereby certify, to the best of my knowledge and belief, that--

(1) The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;

(2) Payments to subcontractors and suppliers have been made from previous payments received under the contract, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract agreements and the requirements of chapter 39 of Title 31, United States Code;

(3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract; and

(4) This certification is not to be construed as final acceptance of a subcontractor's performance.

(Name)

(Title)

(Date)

(d) Refund of Unearned Amounts. If the Contractor, after making a certified request for progress payments, discovers that a portion or all of such request constitutes a payment for performance by the Contractor that fails to conform to the specifications, terms, and conditions of this contract (hereinafter referred to as the "unearned amount"), the Contractor shall--

(1) Notify the Contracting Officer of such performance deficiency; and

(2) Be obligated to pay the Government an amount (computed by the Contracting Officer in the manner provided in paragraph (j) of this clause) equal to interest on the unearned amount from the 8th day after the date of receipt of the unearned amount until--

(i) The date the Contractor notifies the Contracting Officer that the performance deficiency has been corrected; or

(ii) The date the Contractor reduces the amount of any subsequent certified request for progress payments by an amount equal to the unearned amount.

(e) Retainage. If the Contracting Officer finds that satisfactory progress was achieved during any period for which a progress payment is to be made, the Contracting Officer shall authorize payment to be made in full. However, if satisfactory progress has not been made, the Contracting Officer may retain a maximum of 10 percent of the amount of the payment until satisfactory progress is achieved. When the work is substantially complete, the Contracting Officer may retain from previously withheld funds and future progress payments that amount the Contracting Officer considers adequate for protection of the Government and shall release to the Contractor all the remaining withheld funds. Also, on completion and acceptance of each separate building, public work, or other division of the contract, for which the price is stated separately in the contract, payment shall be made for the completed work without retention of a percentage.

(f) Title, Liability, and Reservation of Rights. All material and work covered by progress payments made shall, at the time of payment, become the sole property of the Government, but this shall not be construed as--

(1) Relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or

(2) Waiving the right of the Government to require the fulfillment of all of the terms of the contract.

(g) Reimbursement for Bond Premiums. In making these progress payments, the Government shall, upon request, reimburse the Contractor for the amount of premiums paid for performance and payment bonds (including coinsurance and reinsurance agreements, when applicable) after the Contractor has furnished evidence of full payment to the surety. The retainage provisions in paragraph (e) of this clause shall not apply to that portion of progress payments attributable to bond premiums.

(h) Final Payment. The Government shall pay the amount due the Contractor under this contract after--

(1) Completion and acceptance of all work;

(2) Presentation of a properly executed voucher; and
(3) Presentation of release of all claims against the Government arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned under the Assignment of Claims Act of 1940 (31 U.S.C. 3727 and 41 U.S.C. 15).

(i) Limitation Because of Unfinalized Work. Notwithstanding any provision of this contract, progress payments shall not exceed 80 percent on work accomplished on unfinalized contract actions. A "contract action" is any action resulting in a contract, as defined in FAR Subpart 2.1, including contract modifications for additional supplies or services, but not including contract modifications that are within the scope and under the terms of the contract, such as contract modifications issued pursuant to the Changes clause, or funding and other administrative changes.

(j) Interest Computation on Unearned Amounts. In accordance with 31 U.S.C. 3903(c)(1), the amount payable under subparagraph (d)(2) of this clause shall be--

(1) Computed at the rate of average bond equivalent rates of 91-day Treasury bills auctioned at the most recent auction of such bills prior to the date the Contractor receives the unearned amount; and

(2) Deducted from the next available payment to the Contractor.

84. RESERVED.

85. *FAR 52.232-10 PAYMENTS UNDER FIXED-PRICE ARCHITECT-ENGINEER CONTRACTS (AUG 1987)

(a) Estimates shall be made monthly of the amount and value of the work and services performed by the Contractor under this contract which meet the standards of quality established under this contract. The estimates shall be prepared by the Contractor and accompanied by any supporting data required by the Contracting Officer.

(b) Upon approval of the estimate by the Contracting Officer, payment upon properly executed vouchers shall be made to the Contractor, as soon as practicable, of 90 percent of the approved amount, less all previous payments; provided, that payment may be made in full during any months in which the Contracting Officer determines that performance has been satisfactory. Also, whenever the Contracting Officer determines that the work is substantially complete and that the amount retained is in excess of the amount adequate for the protection of the Government, the Contracting Officer may release the excess amount to the Contractor.

(c) Upon satisfactory completion by the Contractor and acceptance by the Contracting Officer of the work done by the Contractor under the "Statement of Architect-Engineer Services", the Contractor will be paid the unpaid balance of any money due for work under the statement, including retained percentages relating to this portion of the work. Upon satisfactory completion and final acceptance of the construction work, the Contractor shall be paid any unpaid balance of money due under this contract.

(d) Before final payment under the contract, or before settlement upon termination of the contract, and as a condition precedent thereto, the Contractor shall execute and deliver to the Contracting Officer a release of all claims against the Government arising under or by virtue of this contract, other than any claims that are specifically excepted by the Contractor from the operation of the release in amounts stated in the release.

(e) Notwithstanding any other provision in this contract, and specifically paragraph (b) of this clause, progress payments shall not exceed 80 percent on work accomplished on unfinalized contract actions. A "contract action" is any action resulting in a contract, as defined in FAR Subpart 2.1, including contract modifications for additional supplies or services, but not including contract modifications that are within the scope and under the terms of the contract, such as contract modifications issued pursuant to the Changes clause, or funding and other administrative changes. (End of clause)

86. *FAR 52.232-17 INTEREST (JUN 1996)

(a) Except as otherwise provided in this contract under a Price Reduction for Defective Cost or Pricing Data clause or a Cost Accounting Standards clause, all amounts that become payable by the Contractor to the Government under this contract (net of any applicable tax credit under the Internal Revenue Code (26 U.S.C. 1481)) shall bear simple interest from the date due until paid unless paid within 30 days of becoming due. The interest rate shall be the interest rate established by the Secretary of the Treasury as provided in Section 12 of the Contract Disputes Act of 1978 (Public Law 95-563), which is applicable to the period in which the amount becomes due, as provided in paragraph (b) of this clause, and then at the rate applicable for each six-month period as fixed by the Secretary until the amount is paid.

(b) Amounts shall be due at the earliest of the following dates:

(1) The date fixed under this contract.

(2) The date of the first written demand for payment consistent with this contract, including any demand resulting from a default termination.

(3) The date the Government transmits to the Contractor a proposed supplemental agreement to confirm completed negotiations establishing the amount of debt.

(4) If this contract provides for revision of prices, the date of written notice to the Contractor stating the amount of refund payable in connection with a pricing proposal or a negotiated pricing agreement not confirmed by contract modification.

(c) The interest charge made under this clause may be reduced under the procedures prescribed in 32.614-2 of the Federal Acquisition Regulation in effect on the date of this contract.

87. *FAR 52.232-23 ASSIGNMENT OF CLAIMS (JAN 1986)

(a) The Contractor, under the Assignment of Claims Act, as amended, 31 U.S.C. 3727, 41 U.S.C. 15 (hereafter referred to as "the Act"), may assign its rights to be paid amounts due or to become due as a result of the performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency. The assignee under such an assignment may thereafter further assign or reassign its right under the original assignment to any type of financing institution described in the preceding sentence.

(b) Any assignment or reassignment authorized under the Act and this clause shall cover all unpaid amounts payable under this contract, and shall not be made to more than one party, except that an assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in the financing of this contract.

(c) The Contractor shall not furnish or disclose to any assignee under this contract any classified document (including this contract) or information related to work under this contract until the Contracting Officer authorizes such action in writing.

88. *FAR 52.232-26 PROMPT PAYMENT FOR FIXED-PRICE ARCHITECT-ENGINEER CONTRACTS (MAY 2001)

Notwithstanding any other payment terms in this contract, the Government will make invoice payments and contract financing payments under the terms and conditions specified in this clause. Payment shall be considered as being made on the day a check is dated or the date of an electronic funds transfer. Definitions of pertinent terms are set forth in sections 2.101 and 32.902 of the Federal Acquisition Regulation. All days referred to in this clause are calendar days, unless otherwise specified. (However, see subparagraph (a)(3) of this clause concerning payments due on Saturdays, Sundays, and legal holidays.)

(a) Invoice payments.--

(1) Due date. The due date for making invoice payments shall be--

(i) For work or services completed by the Contractor, the later of the following two events:

(A) The 30th day after the designated billing office has received a proper invoice from the Contractor (except as provided in paragraph (a)(1)(iii) of this clause).

(B) The 30th day after Government acceptance of the work or services completed by the Contractor. On a final invoice where the payment amount is subject to contract settlement actions (e.g., release of claims), acceptance shall be deemed to have occurred on the effective date of the contract settlement.

(ii) The due date for progress payments shall be the 30th day after Government approval of Contractor estimates of work or services accomplished.

(iii) If the designated billing office fails to annotate the invoice or payment request with the actual date of receipt at the time of receipt, the payment due date shall be the 30th day after the date of the Contractor's invoice or payment request, provided a proper invoice or payment request is received and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(2) Contractor's invoice. The Contractor shall prepare and submit invoices to the designated billing office specified in the contract. A proper invoice must include the items listed in paragraphs (a)(2)(i) through (a)(2)(viii) of this clause. If the invoice does not comply with these requirements, it shall be returned within 7 days after the date the designated billing office received the invoice, with a statement of the reasons why it is not a proper invoice. Untimely notification will be taken into account in computing any interest penalty owed the Contractor in the manner described in subparagraph (a)(4) of this clause:

(i) Name and address of the Contractor.

(ii) Invoice date. (The Contractor is encouraged to date invoices as close as possible to the date of mailing or transmission.)

(iii) Contract number or other authorization for work or services performed (including order number and contract line item number).

(iv) Description of work or services performed.

(v) Delivery and payment terms (e.g., prompt payment discount terms).

(vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment).

(vii) Name (where practicable), title, phone number, and mailing address of person to be notified in the event of a defective invoice.

(viii) Any other information or documentation required by the contract.

(ix) While not required, the Contractor is strongly encouraged to assign an identification number to each invoice.

(3) Interest penalty. An interest penalty shall be paid automatically by the designated payment office, without request from the Contractor, if payment is not made by the due date and the conditions listed in paragraphs (a)(3)(i) through (a)(3)(iii) of this clause are met, if applicable. However, when the due date falls on a Saturday, Sunday, or legal holiday when Federal Government offices are closed and Government business is not expected to be conducted, payment may be made on the following business day without incurring a late payment interest penalty.

(i) A proper invoice was received by the designated billing office.

(ii) A receiving report or other Government documentation authorizing payment was processed and there was no disagreement over quantity, quality, Contractor compliance with any contract term or condition, or requested progress payment amount.

(iii) In the case of a final invoice for any balance of funds due the Contractor for work or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.

(4) Computing penalty amount. The interest penalty shall be at the rate established by the Secretary of the Treasury under section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) that is in effect on the day after the due date, except where the interest penalty is prescribed by other governmental authority (e.g., tariffs). This rate is referred to as the "Renegotiation Board Interest Rate," and it is published in the Federal Register semiannually on or about January 1 and July 1. The interest penalty shall accrue daily on the invoice principal payment amount approved by the Government until the payment date of such approved principal amount; and will be compounded in 30-day increments inclusive from the first day after the due date through the payment date. That is, interest accrued at the end of any 30-day period will be added to the approved invoice principal payment amount and will be subject to interest penalties if not paid in the succeeding 30-day period. If the designated billing office failed to notify the Contractor of a defective invoice within the periods prescribed in subparagraph (a)(2) of this clause, the due date on the corrected invoice will be adjusted by subtracting from such date the number of days taken

beyond the prescribed notification of defects period. Any interest penalty owed the Contractor will be based on this adjusted due date. Adjustments will be made by the designated payment office for errors in calculating interest penalties.

(i) For the sole purpose of computing an interest penalty that might be due the Contractor, Government acceptance or approval shall be deemed to have occurred constructively as shown in paragraphs (a)(4)(i) (A) and (B) of this clause. In the event that actual acceptance or approval occurs within the constructive acceptance or approval period, the determination of an interest penalty shall be based on the actual date of acceptance or approval. Constructive acceptance or constructive approval requirements do not apply if there is a disagreement over quantity, quality, Contractor compliance with a contract provision, or requested progress payment amounts. These requirements also do not compel Government officials to accept work or services, approve Contractor estimates, perform contract administration functions, or make payment prior to fulfilling their responsibilities.

(A) For work or services completed by the Contractor, Government acceptance shall be deemed to have occurred constructively on the 7th day after the Contractor has completed the work or services in accordance with the terms and conditions of the contract.

(B) For progress payments, Government approval shall be deemed to have occurred on the 7th day after Contractor estimates have been received by the designated billing office.

(ii) The following periods of time will not be included in the determination of an interest penalty:

(A) The period taken to notify the Contractor of defects in invoices submitted to the Government, but this may not exceed 7 days.

(B) The period between the defects notice and resubmission of the corrected invoice by the Contractor.

(C) For incorrect electronic funds transfer (EFT) information, in accordance with the EFT clause of this contract.

(iii) Interest penalties will not continue to accrue after the filing of a claim for such penalties under the clause at 52.233-1, Disputes, or for more than 1 year. Interest penalties of less than \$1 need not be paid.

(iv) Interest penalties are not required on payment delays due to disagreement between the Government and the Contractor over the payment amount or other issues involving contract compliance, or on amounts temporarily withheld or retained in accordance with the terms of the contract. Claims involving disputes, and any interest that may be payable will be resolved in accordance with the clause at 52.233-1, Disputes.

(5) Prompt payment discounts. An interest penalty also shall also be paid automatically by the designated payment office, without request from the Contractor, if a discount for prompt payment is taken improperly. The interest penalty will be calculated on the amount of discount taken for the period beginning with the first day after the end of the discount period through the date when the Contractor is paid.

(6) Additional interest penalty.

(i) A penalty amount, calculated in accordance with paragraph (a)(6)(iii) of this clause, shall be paid in addition to the interest penalty amount if the Contractor --

(A) Is owed an interest penalty of \$1 or more;

(B) Is not paid the interest penalty within 10 days after the date the invoice amount is paid;

and
(C) Makes a written demand to the designated payment office for additional penalty payment, in accordance with paragraph (a)(6)(ii) of this clause, postmarked not later than 40 days after the date the invoice amount is paid.

(ii)(A) Contractors shall support written demands for additional penalty payments with the following data. No additional data shall be required. Contractors shall --

(1) Specifically assert that late payment interest is due under a specific invoice, and request payment of all overdue late payment interest penalty and such additional penalty as may be required;

(2) Attach a copy of the invoice on which the unpaid late payment interest was due; and

(3) State that payment of the principal has been received, including the date of receipt.

(B) Demands must be postmarked on or before the 40th day after payment was made, except that--

(1) If the postmark is illegible or nonexistent, the demand must have been received and annotated with the date of receipt by the designated payment office on or before the 40th day after payment was made; or

(2) If the postmark is illegible or nonexistent and the designated payment office fails to make the required annotation, the demand's validity will be determined by the date the Contractor has placed on the demand; provided such date is no later than the 40th day after payment was made.

(iii)(A) The additional penalty shall be equal to 100 percent of any original late payment interest penalty except--

(1) For additional penalties due on or before January 22, 1992, such penalties shall not exceed \$2,500;

(2) After January 22, 1992, the additional penalty shall not exceed \$5,000;

(3) The additional penalty shall never be less than \$25; and

(4) No additional penalty is owed if the amount of the underlying interest penalty is less than \$1.

(B) If the interest penalty ceases to accrue in accordance with the limits stated in paragraph (a)(4)(iii) of this clause, the amount of the additional penalty shall be calculated on the amount of interest penalty that would have accrued in the absence of these limits, subject to the overall limits on the additional penalty specified in paragraph (a)(6)(iii)(A) of this clause.

(C) For determining the maximum and minimum additional penalties, the test shall be the interest penalty due on each separate payment made for each separate contract. The maximum and minimum additional penalty shall not be based upon individual invoices unless the invoices are paid separately. Where payments are consolidated for disbursing purposes, the maximum and minimum additional penalty determination shall be made separately for each contract therein.

(D) The additional penalty does not apply to payments regulated by other Government regulations (e.g., payments under utility contracts subject to tariffs and regulation).

(b) Contract financing payments--

(1) Due dates for recurring financing payments. If this contract provides for contract financing, requests for payment shall be submitted to the designated billing office as specified in this contract or as directed by the Contracting Officer. Contract financing payments shall be made on the 30th day after receipt of a proper contract financing request by the designated billing office. In the event that an audit or other review of a specific financing request is required to ensure compliance with the terms and conditions of the contract, the designated payment office is not compelled to make payment by the due date specified.

(2) Due dates for other contract financing. For advance payments, loans, or other arrangements that do not involve recurring submissions of contract financing requests, payment shall be made in accordance with the corresponding contract terms or as directed by the Contracting Officer.

(3) Interest penalty not applicable. Contract financing payments shall not be assessed an interest penalty for payment delays. (End of clause)

89. *FAR 52.232-27 PROMPT PAY FOR CONSTRUCTION CONTRACTS (MAY 2001)

Notwithstanding any other payment terms in this contract, the Government will make invoice payments and contract financing payments under the terms and conditions specified in this clause. Payment shall be considered as being made on the day a check is dated or the date of an electronic funds transfer. Definitions of pertinent terms are set forth in sections 2.101 and 32.902 of the Federal Acquisition Regulation. All days referred to in this clause are calendar days, unless otherwise specified. (However, see subparagraph (a)(3) concerning payments due on Saturdays, Sundays, and legal holidays.)

(a) Invoice payments--

(1) Types of invoice payments. For purposes of this clause, there are several types of invoice payments that may occur under this contract, as follows:

(i) Progress payments, if provided for elsewhere in this contract, based on Contracting Officer approval of the estimated amount and value of work or services performed, including payments for reaching milestones in any project:

(A) The due date for making such payments shall be 14 days after receipt of the payment request by the designated billing office. If the designated billing office fails to annotate the payment request with the actual date of receipt at the time of receipt, the payment due date shall be the 14th day after the date of the Contractor's payment request, provided a proper payment request is received and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(B) The due date for payment of any amounts retained by the Contracting Officer in accordance with the clause at 52.232-5, Payments Under Fixed-Price Construction Contracts, shall be as specified in the contract or, if not specified, 30 days after approval for release to the Contractor by the Contracting Officer.

(ii) Final payments based on completion and acceptance of all work and presentation of release of all claims against the Government arising by virtue of the contract, and payments for partial deliveries that have been accepted by the Government (e.g., each separate building, public work, or other division of the contract for which the price is stated separately in the contract):

(A) The due date for making such payments shall be either the 30th day after receipt by the designated billing office of a proper invoice from the Contractor, or the 30th day after Government acceptance of the work or services completed by the Contractor, whichever is later. If the designated billing office fails to annotate the invoice with the date of actual receipt at the time of receipt, the invoice payment due date shall be the 30th day after the date of the Contractor's invoice, provided a proper invoice is received and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(B) On a final invoice where the payment amount is subject to contract settlement actions (e.g., release of claims), acceptance shall be deemed to have occurred on the effective date of the contract settlement.

(2) Contractor's Invoice. The Contractor shall prepare and submit invoices to the designated billing office specified in the contract. A proper invoice must include the items listed in paragraphs (a)(2)(i) through (a)(2)(ix) of this clause. If the invoice does not comply with these requirements, it shall be returned within 7 days after the date the designated billing office received the invoice, with a statement of the reasons why it is not a proper invoice. Untimely notification will be taken into account in computing any interest penalty owed the Contractor in the manner described in subparagraph (a)(4) of this clause.

(i) Name and address of the Contractor.

(ii) Invoice Date. (The Contractor is encouraged to date invoices as close as possible to the date of mailing or transmission.)

(iii) Contract number or other authorization for work or services performed (including order number and contract line item number).

(iv) Description of work or services performed.

(v) Delivery and payment terms (e.g., prompt payment discount terms).

(vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment).

(vii) Name (where practicable), title, phone number, and mailing address of person to be notified in the event of a defective invoice.

(viii) For payments described in paragraph (a)(1)(i) of this clause, substantiation of the amounts requested and certification in accordance with the requirements of the clause at 52.232 -5, Payments Under Fixed-Price Construction Contracts.

(ix) Any other information or documentation required by the contract.

(x) While not required, the Contractor is strongly encouraged to assign an identification number to each invoice.

(3) Interest Penalty. An interest penalty shall be paid automatically by the designated payment office, without request from the Contractor, if payment is not made by the due date and the conditions listed in paragraphs (a)(3)(i) through (a)(3)(iii) of this clause are met, if applicable. However, when the due date falls on a Saturday, Sunday, or legal holiday when Federal Government offices are closed and Government business is not expected to be conducted, payment may be made on the following business day without incurring a late payment interest penalty.

(i) A proper invoice was received by the designated billing office.

(ii) A receiving report or other Government documentation authorizing payment was processed and there was no disagreement over quantity, quality, Contractor compliance with any contract term or condition, or requested progress payment amount.

(iii) In the case of a final invoice for any balance of funds due the Contractor for work or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.

(4) Computing Penalty Amount. The interest penalty shall be at the rate established by the Secretary of the Treasury under section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) that is in effect on the day after the due date, except where the interest penalty is prescribed by other governmental authority (e.g., tariffs). This rate is referred to as the "Renegotiation Board Interest Rate," and it is published in the Federal Register semiannually on or about January 1 and July 1. The interest penalty shall accrue daily on the invoice principal payment amount approved by the Government until the payment date of such approved principal amount; and will be compounded in 30-day increments inclusive from the first day after the due date through the payment date. That is, interest accrued at the end of any 30-day period will be added to the approved invoice principal payment amount and will be subject to interest penalties if not paid in the succeeding 30-day period. If the designated billing office failed to notify the Contractor of a defective invoice within the periods prescribed in subparagraph (a)(2) of this clause, the due date on the corrected invoice will be adjusted by subtracting from such date the number of days taken beyond the prescribed notification of defects period. Any interest penalty owed the Contractor will be based on this adjusted due date. Adjustments will be made by the designated payment office for errors in calculating interest penalties.

(i) For the sole purpose of computing an interest penalty that might be due the Contractor for payments described in paragraph (a)(1)(ii) of this clause, Government acceptance or approval shall be deemed to have occurred constructively on the 7th day after the Contractor has completed the work or services in accordance with the terms and conditions of the contract. In the event that actual acceptance or approval occurs within the constructive acceptance or approval period, the determination of an interest penalty shall be based on the actual date of acceptance or approval. Constructive acceptance or constructive approval requirements do not apply if there is a disagreement over quantity, quality, or Contractor compliance with a contract provision. These requirements also do not compel Government officials to accept work or services, approve Contractor estimates, perform contract administration functions, or make payment prior to fulfilling their responsibilities.

(ii) The following periods of time will not be included in the determination of an interest penalty:

(A) The period taken to notify the Contractor of defects in invoices submitted to the Government, but this may not exceed 7 days.

(B) The period between the defects notice and resubmission of the corrected invoice by the Contractor.

(C) For incorrect electronic funds transfer (EFT) information, in accordance with the EFT clause of this contract.

(iii) Interest penalties will not continue to accrue after the filing of a claim for such penalties under the clause at 52.233-1, Disputes, or for more than 1 year. Interest penalties of less than \$1 need not be paid.

(iv) Interest penalties are not required on payment delays due to disagreement between the Government and the Contractor over the payment amount or other issues involving contract compliance, or on amounts temporarily withheld or retained in accordance with the terms of the contract. Claims involving disputes, and any interest that may be payable, will be resolved in accordance with the clause at 52.233-1, Disputes.

(5) Prompt Payment Discounts. An interest penalty also shall be paid automatically by the designated payment office, without request from the Contractor, if a discount for prompt payment is taken improperly. The interest penalty will be calculated on the amount of discount taken for the period beginning with the first day after the end of the discount period through the date when the Contractor is paid.

(6) Additional Interest Penalty.

(i) If this contract was awarded on or after October 1, 1989, a penalty amount, calculated in accordance with subdivision (a)(6)(iii) of this clause, shall be paid in addition to the interest penalty amount if the Contractor--

(A) Is owed an interest penalty of \$1 or more;

(B) Is not paid the interest penalty within 10 days after the date the invoice amount is paid; and

(C) Makes a written demand to the designated payment office for additional penalty payment, in accordance with subdivision (a)(6)(ii) of this clause, postmarked not later than 40 days after the date the invoice amount is paid.

(ii)(A) Contractors shall support written demands for additional penalty payments with the following data. No additional data shall be required. Contractors shall --

(1) Specifically assert that late payment interest is due under a specific invoice, and request payment of all overdue late payment interest penalty and such additional penalty as may be required;

(2) Attach a copy of the invoice on which the unpaid late payment interest was due; and

(3) State that payment of the principal has been received, including the date of receipt.

(B) Demands must be postmarked on or before the 40th day after payment was made, except that--

(1) If the postmark is illegible or nonexistent, the demand must have been received and annotated with the date of receipt by the designated payment office on or before the 40th day after payment was made; or

(2) If the postmark is illegible or nonexistent and the designated payment office fails to make the required annotation, the demand's validity will be determined by the date the Contractor has placed on the demand; provided such date is no later than the 40th day after payment was made.

(iii)(A) The additional penalty shall be equal to 100 percent of any original late payment interest penalty that is due on or after January 22, 1990, except--

(1) For additional penalties due on or before January 22, 1992, such penalties shall not exceed \$2,500;

(2) After January 22, 1992, the additional penalty shall not exceed \$5,000;

(3) The additional penalty shall never be less than \$25; and

(4) No additional penalty is owed if the amount of the underlying interest penalty is less than \$1.

(B) If the interest penalty ceases to accrue in accordance with the limits stated in subdivision (a)(4)(iii) of this clause, the amount of the additional penalty shall be calculated on the amount of interest penalty that would have accrued in the absence of these limits, subject to the overall limits on the additional penalty specified in subdivision (a)(6)(iii)(A) of this clause.

(C) For determining the maximum and minimum additional penalties, the test shall be the interest penalty due on each separate payment made for each separate contract. The maximum and minimum additional penalty shall not be based upon individual invoices unless the invoices are paid separately. Where payments are consolidated for disbursing purposes, the maximum and minimum additional penalty determination shall be made separately for each contract therein.

(D) The additional penalty does not apply to payments regulated by other Government regulations (e.g., payments under utility contracts subject to tariffs and regulation).

(b) Contract Financing Payments--

(1) Due dates for recurring financing payments. If this contract provides for contract financing, requests for payment shall be submitted to the designated billing office as specified in this contract or as directed by the Contracting Officer. Contract financing payments shall be made on the (insert day as prescribed by Agency head; if not prescribed, insert 30th day) day after receipt of a proper contract financing request by the designated billing office. In the event that an audit or other review of a specific financing request is required to ensure compliance with the terms and conditions of the contract, the designated payment office is not compelled to make payment by the due date specified.

(2) Due dates for other contract financing. For advance payments, loans, or other arrangements that do not involve recurring submissions of contract financing requests, payment shall be made in accordance with the corresponding contract terms or as directed by the Contracting Officer.

(3) Interest Penalty Not Applicable. Contract financing payments shall not be assessed an interest penalty for payment delays.

(c) Subcontract Clause Requirements. The Contractor shall include in each subcontract for property or services (including a material supplier) for the purpose of performing this contract the following:

(1) Prompt Payment for Subcontractors. A payment clause that obligates the Contractor to pay the subcontractor for satisfactory performance under its subcontract not later than 7 days from receipt of payment out of such amounts as are paid to the Contractor under this contract.

(2) Interest for Subcontractors. An interest penalty clause that obligates the Contractor to pay to the subcontractor an interest penalty for each payment not made in accordance with the payment clause --

(i) For the period beginning on the day after the required payment date and ending on the date on which payment of the amount due is made; and

(ii) Computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(3) Subcontractor Clause Flowdown. A clause requiring each subcontractor to include a payment clause and an interest penalty clause conforming to the standards set forth in subparagraphs (c)(1) and (c)(2) of this clause in each of its subcontracts, and to require each of its subcontractors to include such clauses in their subcontracts with each lower-tier subcontractor or supplier.

(d) Subcontract Clause Interpretation. The clauses required by paragraph (c) of this clause shall not be construed to impair the right of the Contractor or a subcontractor at any tier to negotiate, and to include in their subcontract, provisions that--

(1) Retainage Permitted. Permit the Contractor or a subcontractor to retain (without cause) a specified percentage of each progress payment otherwise due to a subcontractor for satisfactory performance under the subcontract without incurring any obligation to pay a late payment interest penalty, in accordance with terms and conditions agreed to by the parties to the subcontract, giving such recognition as the parties deem appropriate to the ability of a subcontractor to furnish a performance bond and a payment bond;

(2) Withholding Permitted. Permit the Contractor or subcontractor to make a determination that part or all of the subcontractor's request for payment may be withheld in accordance with the subcontract agreement; and

(3) Withholding Requirements. Permit such withholding without incurring any obligation to pay a late payment penalty if--

(i) A notice conforming to the standards of paragraph (g) of this clause previously has been furnished to the subcontractor; and

(ii) A copy of any notice issued by a Contractor pursuant to subdivision (d)(3)(i) of this clause has been furnished to the Contracting Officer.

(e) Subcontractor Withholding Procedures. If a Contractor, after making a request for payment to the Government but before making a payment to a subcontractor for the subcontractor's performance covered by the payment request, discovers that all or a portion of the payment otherwise due such subcontractor is subject to withholding from the subcontractor in accordance with the subcontract agreement, then the Contractor shall --

(1) Subcontractor Notice. Furnish to the subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon ascertaining the cause giving rise to a withholding, but prior to the due date for subcontractor payment;

(2) Contracting Officer Notice. Furnish to the Contracting Officer, as soon as practicable, a copy of the notice furnished to the subcontractor pursuant to subparagraph (e)(1) of this clause;

(3) Subcontractor Progress Payment Reduction. Reduce the subcontractor's progress payment by an amount not to exceed the amount specified in the notice of withholding furnished under subparagraph (e)(1) of this clause;

(4) Subsequent Subcontractor Payment. Pay the subcontractor as soon as practicable after the correction of the identified subcontract performance deficiency, and--

(i) Make such payment within--

(A) Seven days after correction of the identified subcontract performance deficiency (unless the funds therefor must be recovered from the Government because of a reduction under paragraph (e)(5)(i) of this clause; or

(B) Seven days after the Contractor recovers such funds from the Government; or

(ii) Incur an obligation to pay a late payment interest penalty computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments

under section 12 of the Contracts Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty;

(5) Notice to Contracting Officer. Notify the Contracting Officer upon--

- (i) Reduction of the amount of any subsequent certified application for payment; or
- (ii) Payment to the subcontractor of any withheld amounts of a progress payment,

specifying--

(A) The amounts withheld under subparagraph (e)(1) of this clause; and

(B) The dates that such withholding began and ended; and

(6) Interest to Government. Be obligated to pay to the Government an amount equal to interest on the withheld payments (computed in the manner provided in 31 U.S.C. 3903(c)(1)), from the 8th day after receipt of the withheld amounts from the Government until --

- (i) The day the identified subcontractor performance deficiency is corrected; or
- (ii) The date that any subsequent payment is reduced under subdivision (e)(5)(i) of this

clause.

(f) Third-Party Deficiency Reports--(1) Withholding from subcontractor. If a Contractor, after making payment to a first-tier subcontractor, receives from a supplier or subcontractor of the first-tier subcontractor (hereafter referred to as a "second-tier subcontractor") a written notice in accordance with section 2 of the Act of August 24, 1935 (40 U.S.C. 270b, Miller Act), asserting a deficiency in such first-tier subcontractor's performance under the contract for which the Contractor may be ultimately liable, and the Contractor determines that all or a portion of future payments otherwise due such first-tier subcontractor is subject to withholding in accordance with the subcontract agreement, the Contractor may, without incurring an obligation to pay an interest penalty under subparagraph (e)(6) of this clause--

(i) Furnish to the first-tier subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon making such determination; and

(ii) Withhold from the first-tier subcontractor's next available progress payment or payments an amount not to exceed the amount specified in the notice of withholding furnished under paragraph (f)(1)(i) of this clause.

(2) Subsequent Payment or Interest Charge. As soon as practicable, but not later than 7 days after receipt of satisfactory written notification that the identified subcontract performance deficiency has been corrected, the Contractor shall --

(i) Pay the amount withheld under paragraph (f)(1)(ii) of this clause to such first-tier subcontractor; or

(ii) Incur an obligation to pay a late payment interest penalty to such first-tier subcontractor computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under section 12 of the Contracts Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(g) Written Notice of Subcontractor Withholding. A written notice of any withholding shall be issued to a subcontractor (with a copy to the Contracting Officer of any such notice issued by the Contractor), specifying--

- (1) The amount to be withheld;
- (2) The specific causes for the withholding under the terms of the subcontract; and
- (3) The remedial actions to be taken by the subcontractor in order to receive payment of the

amounts withheld.

(h) Subcontractor Payment Entitlement. The Contractor may not request payment from the Government of any amount withheld or retained in accordance with paragraph (d) of this clause until such time as the Contractor has determined and certified to the Contracting Officer that the subcontractor is entitled to the payment of such amount.

(i) Prime-Subcontractor Disputes. A dispute between the Contractor and subcontractor relating to the amount or entitlement of a subcontractor to a payment or a late payment interest penalty under a clause included in the subcontract pursuant to paragraph (c) of this clause does not constitute a dispute to which the United States is a party. The United States may not be interpleaded in any judicial or administrative proceeding involving such a dispute.

(j) Preservation of Prime-Subcontractor Rights. Except as provided in paragraph (i) of this clause, this clause shall not limit or impair any contractual, administrative, or judicial remedies otherwise available to the

Contractor or a subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or nonperformance by a subcontractor.

(k) **Non-Recourse for Prime Contractor Interest Penalty.** The Contractor's obligation to pay an interest penalty to a subcontractor pursuant to the clauses included in a subcontract under paragraph (c) of this clause shall not be construed to be an obligation of the United States for such interest penalty. A cost-reimbursement claim may not include any amount for reimbursement of such interest penalty.

90. *FAR 52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER –CENTRAL CONTRACTOR REGISTRATION (MAY 1999)

(a) *Method of payment.* (1) All payments by the Government under this contract shall be made by electronic funds transfer (EFT), except as provided in paragraph (a)(2) of this clause. As used in this clause, the term “EFT” refers to the funds transfer and may also include the payment information transfer.

(2) In the event the Government is unable to release one or more payments by EFT, the Contractor agrees to either—

(i) Accept payment by check or some other mutually agreeable method of payment; or

(ii) Request the Government to extend the payment due date until such time as the Government can make payment by EFT (but see paragraph (d) of this clause).

(b) *Contractor's EFT information.* The Government shall make payment to the Contractor using the EFT information contained in the Central Contractor Registration (CCR) database. In the event that the EFT information changes, the Contractor shall be responsible for providing the updated information to the CCR database.

(c) *Mechanisms for EFT payment.* The Government may make payment by EFT through either the Automated Clearing House (ACH) network, subject to the rules of the National Automated Clearing House Association, or the Fedwire Transfer System. The rules governing Federal payments through the ACH are contained in 31 CFR part 210.

(d) *Suspension of payment.* If the Contractor's EFT information in the CCR database is incorrect, then the Government need not make payment to the Contractor under this contract until correct EFT information is entered into the CCR database; and any invoice or contract financing request shall be deemed not to be a proper invoice for the purpose of prompt payment under this contract. The prompt payment terms of the contract regarding notice of an improper invoice and delays in accrual of interest penalties apply.

(e) *Contractor EFT arrangements.* If the Contractor has identified multiple payment receiving points (i.e., more than one remittance address and/or EFT information set) in the CCR database, and the Contractor has not notified the Government of the payment receiving point applicable to this contract, the Government shall make payment to the first payment receiving point (EFT information set or remittance address as applicable) listed in the CCR database.

(f) *Liability for uncompleted or erroneous transfers.* (1) If an uncompleted or erroneous transfer occurs because the Government used the Contractor's EFT information incorrectly, the Government remains responsible for—

(i) Making a correct payment;

(ii) Paying any prompt payment penalty due; and

(iii) Recovering any erroneously directed funds.

(2) If an uncompleted or erroneous transfer occurs because the Contractor's EFT information was incorrect, or was revised within 30 days of Government release of the EFT payment transaction instruction to the Federal Reserve System, and—

(i) If the funds are no longer under the control of the payment office, the Government is deemed to have made payment and the Contractor is responsible for recovery of any erroneously directed funds; or

(ii) If the funds remain under the control of the payment office, the Government shall not make payment, and the provisions of paragraph (d) of this clause shall apply.

(g) *EFT and prompt payment.* A payment shall be deemed to have been made in a timely manner in accordance with the prompt payment terms of this contract if, in the EFT payment transaction instruction released to the Federal Reserve System, the date specified for settlement of the payment is on or before the prompt payment due date, provided the specified payment date is a valid date under the rules of the Federal Reserve System.

(h) *EFT and assignment of claims.* If the Contractor assigns the proceeds of this contract as provided for in the assignment of claims terms of this contract, the Contractor shall require as a condition of any such assignment, that the assignee shall register in the CCR database and shall be paid by EFT in accordance with the terms of this clause. In all respects, the requirements of this clause shall apply to the assignee as if it were the Contractor. EFT information that shows the ultimate recipient of the transfer to be other than the Contractor, in the absence of a proper assignment of claims acceptable to the Government, is incorrect EFT information within the meaning of paragraph (d) of this clause.

(i) *Liability for change of EFT information by financial agent.* The Government is not liable for errors resulting from changes to EFT information made by the Contractor's financial agent.

(j) *Payment information.* The payment or disbursing office shall forward to the Contractor available payment information that is suitable for transmission as of the date of release of the EFT instruction to the Federal Reserve System. The Government may request the Contractor to designate a desired format and method(s) for delivery of payment information from a list of formats and methods the payment office is capable of executing. However, the Government does not guarantee that any particular format or method of delivery is available at any particular payment office and retains the latitude to use the format and delivery method most convenient to the Government. If the Government makes payment by check in accordance with paragraph (a) of this clause, the Government shall mail the payment information to the remittance address contained in the CCR database.
(End of Clause)

91. DFARS 252.232-7004 DOD PROGRESS PAYMENT RATES (OCT 2001)

(a) If the contractor is a small business concern, the Progress Payments clause of this contract is modified to change each mention of the progress payment rate and liquidation rate (excepting paragraph (k), *Limitations on Unfinalized Contract Actions*) to 90 percent.

(b) If the contractor is a small disadvantaged business concern, the Progress Payments clause of this contract is modified to change each mention of the progress payment rate and liquidation rate (excepting paragraph (k), *Limitations on Unfinalized Contract Actions*) to 95 percent.
(End of clause)

92. DFARS 252.232-7005 REIMBURSEMENT OF SUBCONTRACTOR ADVANCE PAYMENTS--DOD PILOT MENTOR-PROTEGE PROGRAM (SEP 2001)

(a) The Government will reimburse the Contractor for any advance payments made by the Contractor, as a mentor firm, to a protege firm, pursuant to an approved mentor-protege agreement, provided-

(1) The Contractor's subcontract with the protege firm includes a provision substantially the same as FAR 52.232-12, Advance Payments;

(2) The Contractor has administered the advance payments in accordance with the policies of FAR Subpart 32.4; and

(3) The Contractor agrees that any financial loss resulting from the failure or inability of the protege firm to repay any unliquidated advance payments is the sole financial responsibility of the Contractor.

(b) For a fixed price type contract, advance payments made to a protege firm shall be paid and administered as if they were 100 percent progress payments. The Contractor shall include as a separate attachment with each Standard Form (SF) 1443, Contractor's Request for Progress Payment, a request for reimbursement of advance payments made to a protege firm. The attachment shall provide a separate calculation of lines 14a through 14e of SF 1443 for each protege, reflecting the status of advance payments made to that protege.

(c) For cost reimbursable contracts, reimbursement of advance payments shall be made via public voucher. The Contractor shall show the amounts of advance payments made to each protege on the public voucher, in the form and detail directed by the cognizant contracting officer or contract auditor.
(End of clause)

(a) This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613).

(b) Except as provided in the Act, all disputes arising under or relating to this contract shall be resolved under this clause.

(c) 'Claim,' as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to this contract. A claim arising under a contract, unlike a claim relating to that contract, is a claim that can be resolved under a contract clause that provides for the relief sought by the claimant. However, a written demand or written assertion by the Contractor seeking the payment of money exceeding \$100,000 is not a claim under the Act until certified as required by subparagraph (d)(2) of this clause. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim under the Act. The submission may be converted to a claim under the Act, by complying with the submission and certification requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

(d)(1) A claim by the Contractor shall be made in writing and, unless otherwise stated in this contract, submitted within 6 years after accrual of the claim to the Contracting Officer for a written decision. A claim by the Government against the Contractor shall be subject to a written decision by the Contracting Officer.

(2) (i) Contractors shall provide the certification specified in paragraph (d)(2)(iii) of this clause when submitting any claim exceeding \$100,000.

(ii) The certification requirement does not apply to issues in controversy that have not been submitted as all or part of a claim.

(iii) The certification shall state as follows:

'I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable; and that I am duly authorized to certify the claim on behalf of the Contractor.'

(3) The certification may be executed by any person duly authorized to bind the Contractor with respect to the claim.

(e) For Contractor claims of \$100,000 or less, the Contracting Officer must, if requested in writing by the Contractor, render a decision within 60 days of the request. For Contractor-certified claims over \$100,000, the Contracting Officer must, within 60 days, decide the claim or notify the Contractor of the date by which the decision will be made.

(f) The Contracting Officer's decision shall be final unless the Contractor appeals or files a suit as provided in the Act.

(g) If the claim by the Contractor is submitted to the Contracting Officer or a claim by the Government is presented to the Contractor, the parties, by mutual consent, may agree to use alternative dispute resolution (ADR). If the Contractor refuses an offer for ADR, the Contractor shall inform the Contracting Officer, in writing, of the Contractor's specific reasons for rejecting the offer.

(h) The Government shall pay interest on the amount found due and unpaid from (1) the date the Contracting Officer receives the claim (certified if required), or (2) the date that payment otherwise would be due, if that date is later, until the date of payment. With regard to claims having defective certifications, as defined in (FAR) 48 CFR 33.201, interest shall be paid from the date that the Contracting Officer initially receives the claim. Simple interest on claims shall be paid at the rate, fixed by the Secretary of the Treasury as provided in the Act, which is applicable to the period during which the Contracting Officer receives the claim and then at the rate applicable for each 6-month period as fixed by the Treasury Secretary during the pendency of the claim.

(i) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under the contract, and comply with any decision of the Contracting Officer.

94. *FAR 52.233-1I DISPUTES (DEC 1998) ALTERNATE I (DEC 1991)

(a) This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613).

(b) Except as provided in the Act, all disputes arising under or relating to this contract shall be resolved under this clause.

(c) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to this contract. A claim arising under a contract, unlike a claim relating to that contract, is a claim that can be resolved under a contract clause that provides for the relief sought by the claimant. However, a written demand or written assertion by the Contractor seeking the payment of money exceeding \$100,000 is not a claim under the Act until certified as required by subparagraph (d)(2) of this clause. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim under the Act. The submission may be converted to a claim under the Act, by complying with the submission and certification requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

(d)(1) A claim by the Contractor shall be made in writing and, unless otherwise stated in this contract, submitted within 6 years after accrual of the claim to the Contracting Officer for a written decision. A claim by the Government against the Contractor shall be subject to a written decision by the Contracting Officer.

(2) (i) Contractors shall provide the certification specified in paragraph (d)(2)(iii) of this clause when submitting any claim exceeding \$100,000.

(ii) The certification requirement does not apply to issues in controversy that have not been submitted as all or part of a claim.

(iii) The certification shall state as follows: "I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable; and that I am duly authorized to certify the claim on behalf of the Contractor."

(3) The certification may be executed by any person duly authorized to bind the Contractor with respect to the claim.

(e) For Contractor claims of \$100,000 or less, the Contracting Officer must, if requested in writing by the Contractor, render a decision within 60 days of the request. For Contractor-certified claims over \$100,000, the Contracting Officer must, within 60 days, decide the claim or notify the Contractor of the date by which the decision will be made.

(f) The Contracting Officer's decision shall be final unless the Contractor appeals or files a suit as provided in the Act.

(g) If the claim by the Contractor is submitted to the Contracting Officer or a claim by the Government is presented to the Contractor, the parties, by mutual consent, may agree to use alternative dispute resolution (ADR). If the Contractor refuses an offer for ADR, the Contractor shall inform the Contracting Officer, in writing, of the Contractor's specific reasons for rejecting the offer.

(h) The Government shall pay interest on the amount found due and unpaid from (1) the date that the Contracting Officer receives the claim (certified, if required); or (2) the date that payment otherwise would be due, if that date is later, until the date of payment. With regard to claims having defective certifications, as defined in FAR 33.201, interest shall be paid from the date that the Contracting Officer initially receives the claim. Simple interest on claims shall be paid at the rate, fixed by the Secretary of the Treasury as provided in the Act, which is applicable to the period during which the Contracting Officer receives the claim and then at the rate applicable for each 6-month period as fixed by the Treasury Secretary during the pendency of the claim.

(i) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under or relating to the contract, and comply with any decision of the Contracting Officer. (End of clause)

95. *FAR 52.233-3 PROTEST AFTER AWARD (AUG 1996)

(a) Upon receipt of a notice of protest (as defined in FAR 33.101) or a determination that a protest is likely (see FAR 33.102(d)), the Contracting Officer may, by written order to the Contractor, direct the Contractor to stop performance of the work called for by this contract. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Upon receipt of the final decision in the protest, the Contracting Officer shall either--

(1) Cancel the stop-work order; or

(2) Terminate the work covered by the order as provided in the Default, or the Termination for Convenience of the Government, clause of this contract.

(b) If a stop-work order issued under this clause is canceled either before or after a final decision in the protest, the Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule or contract price, or both, and the contract shall be modified, in writing, accordingly, if--

(1) The stop-work order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of any part of this contract; and

(2) The Contractor asserts its right to an adjustment within 30 days after the end of the period of work stoppage; provided, that if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon a proposal at any time before final payment under this contract.

(c) If a stop-work order is not canceled and the work covered by the order is terminated for the convenience of the Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.

(d) If a stop-work order is not canceled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

(e) The Government's rights to terminate this contract at any time are not affected by action taken under this clause.

(f) If, as the result of the Contractor's intentional or negligent misstatement, misrepresentation, or miscertification, a protest related to this contract is sustained, and the Government pays costs, as provided in FAR 33.102(b)(2) or 33.104(h)(1), the Government may require the Contractor to reimburse the Government the amount of such costs. In addition to any other remedy available, and pursuant to the requirements of Subpart 32.6, the Government may collect this debt by offsetting the amount against any payment due the Contractor under any contract between the Contractor and the Government.

96. RESERVED.

97. FAR 52.236-2 DIFFERING SITE CONDITIONS (APR 1984)

(a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of

(1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or

(2) unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.

(b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the contract modified in writing accordingly.

(c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required, provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.

(d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

**98. *FAR 52.236-3
(APR 1984)**

SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to

- (1) conditions bearing upon transportation, disposal, handling, and storage of materials;
- (2) the availability of labor, water, electric power, and roads;
- (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site;
- (4) the conformation and conditions of the ground; and
- (5) the character of equipment and facilities needed preliminary to and during work

performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.

(b) The Government assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Government. Nor does the Government assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

99. *FAR 52.236-5

MATERIAL AND WORKMANSHIP (APR 1984)

(a) All equipment, material, and articles incorporated into the work covered by this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.

(b) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. When directed to do so, the Contractor shall submit samples for approval at the Contractor's expense, with all shipping charges prepaid. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

(c) All work under this contract shall be performed in a skillful and workmanlike manner. The Contracting Officer may require, in writing, that the Contractor remove from the work any employee the Contracting Officer deems incompetent, careless, or otherwise objectionable.

100. *FAR 52.236-6

SUPERINTENDENCE BY THE CONTRACTOR (APR 1984)

At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the work site a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.

101. FAR 52.236-7 PERMITS AND RESPONSIBILITIES (NOV 1991)

The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any Federal, State, and municipal laws, codes, and regulations applicable to the performance of the work. The Contractor shall also be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.

102. *FAR 52.236-8 OTHER CONTRACTS (APR 1984)

The Government may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with Government employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by Government employees.

103. *FAR 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (APR 1984)

(a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

(b) The Contractor shall protect from damage all existing improvements and utilities

- (1) at or near the work site, and
- (2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refused to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

104. FAR 52.236-10 OPERATIONS AND STORAGE AREAS (APR 1984)

(a) The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.

(b) Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property

of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.

(c) The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

105. *FAR 52.236-11 USE AND POSSESSION PRIOR TO COMPLETION (APR 1984)

(a) The Government shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the Government intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The Government's possession or use shall not be deemed an acceptance of any work under the contract.

(b) While the Government has such possession or use, the Contractor shall be relieved of the responsibility for the loss of or damage to the work resulting from the Government's possession or use, notwithstanding the terms of the clause in this contract entitled "Permits and Responsibilities." If prior possession or use by the Government delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

106. *FAR 52.236-12 CLEANING UP (APR 1984)

The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. Before completing the work, the Contractor shall remove from the work and premises any rubbish, tools, scaffolding, equipment, and materials that are not the property of the Government. Upon completing the work, the Contractor shall leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer.

107. *FAR 52.236-13 ACCIDENT PREVENTION-ALTERNATE I (NOV 1991)

(a) The Contractor shall provide and maintain work environments and procedures which will (1) safeguard the public and Government personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities; (2) avoid interruptions of Government operations and delays in project completion dates; and (3) control costs in the performance of this contract.

(b) For these purposes on contracts for construction or dismantling, demolition, or removal of improvements, the Contractor shall--

(1) Provide appropriate safety barricades, signs, and signal lights;
(2) Comply with the standards issued by the Secretary of Labor at 29 CFR Part 1926 and 29 CFR Part 1910; and

(3) Ensure that any additional measures the Contracting Officer determines to be reasonably necessary for the purposes are taken.

(c) If this contract is for construction or dismantling, demolition or removal of improvements with any Department of Defense agency or component, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation.

(d) Whenever the Contracting Officer becomes aware of any noncompliance with these requirements or any condition which poses a serious or imminent danger to the health or safety of the public or Government personnel, the Contracting Officer shall notify the Contractor orally, with written confirmation, and request immediate initiation of corrective action. This notice, when delivered to the Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule on any stop work order issued under this clause.

(e) The Contractor shall insert this clause, including this paragraph (e), with appropriate changes in the designation of the parties, in subcontractors.

(f) Before commencing the work, the Contractor shall--

(1) Submit a written proposed plan for implementing this clause. The plan shall include an analysis of the significant hazards to life, limb, and property inherent in contract work performance and a plan for controlling these hazards; and

(2) Meet with representatives of the Contracting Officer to discuss and develop a mutual understanding relative to administration of the overall safety program.

108. *FAR 52.236-14 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)

(a) The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

(b) The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

109. FAR 52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984)

(a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring materials, plant, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule.

(b) The Contractor shall enter the actual progress on the chart as directed by the Contracting Officer, and upon doing so shall immediately deliver three copies of the annotated schedule to the Contracting Officer. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

(c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of this contract.

110. *FAR 52.236-17 LAYOUT OF WORK (APR 1984)

The Contractor shall lay out its work from Government-established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

111. FAR 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997)

(a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

(b) Wherever in the specifications or upon the drawings the words "directed," "required," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the "direction," "requirement," "order," "designation," or "prescription," of the Contracting Officer is intended and similarly the words "approved," "acceptable," "satisfactory," or words of like import shall mean "approved by," or "acceptable to," or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

(c) Where "as shown," "as indicated," "as detailed," or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place," that is "furnished and installed."

(d) Shop drawings means drawings, submitted to the Government by the Contractor, subcontractor, or any lower tier subcontractor pursuant to a construction contract, showing in detail

(1) the proposed fabrication and assembly of structural elements, and

(2) the installation (i.e., fit, and attachment details) of materials or equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the Government's reasons therefor. Any work done before such approval shall be at the Contractor's risk. Approval by the

Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.

(f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Contracting Officer approves any such variation, the Contracting Officer shall issue an appropriate contract modification, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.

(g) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the Contracting Officer and one set will be returned to the Contractor.

112. *FAR 52.236-23 RESPONSIBILITY OF THE ARCHITECT-ENGINEER CONTRACTOR (APR 1984)

(a) The Contractor shall be responsible for the professional quality, technical accuracy, and the coordination of all designs, drawings, specifications, and other services furnished by the Contractor under this contract. The Contractor shall, without additional compensation, correct or revise any errors or deficiencies in its designs, drawings, specifications, and other services.

(b) Neither the Government's review, approval or acceptance of, nor payment for, the services required under this contract shall be construed to operate as a waiver of any rights under this contract or of any cause of action arising out of the performance of this contract, and the Contractor shall be and remain liable to the Government in accordance with applicable law for all damages to the Government caused by the Contractor's negligent performance of any of the services furnished under this contract.

(c) The rights and remedies of the Government provided for under this contract are in addition to any other rights and remedies provided by law.

(d) If the Contractor is comprised of more than one legal entity, each such entity shall be jointly and severally liable hereunder. (End of clause)

113. *FAR 52.236-24 WORK OVERSIGHT IN ARCHITECT-ENGINEER CONTRACTS (APR 1984)

The extent and character of the work to be done by the Contractor shall be subject to the general oversight, supervision, direction, control, and approval of the Contracting Officer. (End of clause)

114. *FAR 52.236-25 REQUIREMENTS FOR REGISTRATION OF DESIGNERS (APR 1984)

The design of architectural, structural, mechanical, electrical, civil, or other engineering features of the work shall be accomplished or reviewed and approved by architects or engineers registered to practice in the particular professional field involved in a State or possession of the United States, in Puerto Rico, or in the District of Columbia. (End of clause)

115. *FAR 52.236-26 PRECONSTRUCTION CONFERENCE (FEB 1995)

If the Contracting Officer decides to conduct a preconstruction conference, the successful offeror will be notified and will be required to attend. The Contracting Officer's notification will include specific details regarding the date, time, and location of the conference, any need for attendance by subcontractors, and information regarding the items to be discussed.

116. DFARS 252.236-7000 MODIFICATION OF PROPOSALS - PRICE BREAKDOWN (DEC 1991)

- (a) The Contractor shall furnish a price breakdown, itemized as required and within the time specified by the Contracting Officer, with any proposal for a contract modification.
- (b) The price breakdown--
 - (1) Must include sufficient detail to permit an analysis of profit, and of all costs for--
 - (i) Material;
 - (ii) Labor,
 - (iii) Equipment;
 - (iv) Subcontracts; and
 - (2) Must cover all work involved in the modification, whether the work was deleted, added, or changed.
- (c) The Contractor shall provide similar price breakdowns to support any amounts claimed for subcontracts.
- (d) The Contractor's proposal shall include a justification for any time extension proposed.

117. *FAR 52.242-13 BANKRUPTCY (JUL 1995)

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish, by certified mail or electronic commerce method authorized by the contract, written notification of the bankruptcy to the Contracting Officer responsible for administering the contract. This notification shall be furnished within five days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of Government contract numbers and contracting offices for all Government contracts against which final payment has not been made. This obligation remains in effect until final payment under this contract.

118. *FAR 52.242-14 SUSPENSION OF WORK (APR 1984)

- (a) The Contracting Officer may order the Contractor, in writing, to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the Government.
- (b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified in this contract (or within a reasonable time if not specified), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by the unreasonable suspension, delay, or interruption, and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or for which an equitable adjustment is provided for or excluded under any other term or condition of this contract.
- (c) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order), and (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption, but not later than the date of final payment under the contract.

119. DFARS 252.242-7005 COST/SCHEDULE STATUS REPORT (MAR 1998)

- (a) The Contractor shall use management procedures in the performance of this contract that provide for --

- (1) Planning and control of costs;
 - (2) Measurement of performance (value for completed tasks); and
 - (3) Generation of timely and reliable information for the cost/schedule status report (C/SSR).
- (b) As a minimum, these procedures must provide for--
- (1) Establishing the time-phased budgeted cost of work scheduled (including work authorization, budgeting, and scheduling), the budgeted cost for work performed, the actual cost of work performed, the budget at completion, the estimate at completion, and provisions for subcontractor performance measurement and reporting;
 - (2) Applying all direct and indirect costs and provisions for use and control of management reserve and undistributed budget;
 - (3) Incorporating changes to the contract budget base for both Government directed changes and internal replanning;
 - (4) Establishing constraints to preclude subjective adjustment of data to ensure performance measurement remains realistic. The total allocated budget may exceed the contract budget base only after consultation with the Contracting Officer. For cost-reimbursement contracts, the contract budget base shall exclude changes for cost growth increases, other than for authorized changes to the contract scope; and
 - (5) Establishing the capability to accurately identify and explain significant cost and schedule variances, both on a cumulative basis and projected at completion basis.
- (c) The Offeror/Contractor may use a cost/schedule control system that has been recognized by the cognizant Administrative Contracting Officer (ACO) as complying with the earned value management system criteria provided in DoD 5000.2-R, Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs.
- (d) The Government may require integrated baseline reviews. Such reviews shall be scheduled as early as practicable and should be conducted within 180 calendar days after (1) contract award, (2) the exercise of significant contract options, or (3) the incorporation of major modifications. The objective of the integrated baseline review is for the Government and the Contractor to jointly assess areas, such as the Contractor's planning, to ensure complete coverage of the statement of work, logical scheduling of the work activities, adequate resourcing, and identification of inherent risks.
- (e) The Contractor shall provide access to all pertinent records, company procedures, and data requested by the Contracting Officer, or authorized representative, to--
- (1) Show proper implementation of the procedures generating the cost schedule information being used to satisfy the C/SSR contractual data requirements to the Government; and
 - (2) Ensure continuing application of the accepted company procedures in satisfying the C/SSR data item.
- (f) The Contractor shall submit any substantive changes to the procedures and their impact to the ACO for review.
- (g) The Contractor shall require a subcontractor to furnish C/SSR in each case where the subcontract is other than firm fixed-price, is 12 months or more in duration, and has critical or significant tasks related to the prime contract. Critical or significant tasks shall be defined by mutual agreement between the Government and Contractor. Each subcontractor's reported cost and schedule information shall be incorporated into the Contractor's C/SSR.
- (End of clause)

120. *FAR 52.243-1 CHANGES--FIXED-PRICE (AUG 1987) ALTERNATE III (AUG 1984)

- (a) The Contracting Officer may at any time, by written order, and without notice to the sureties, if any, make changes within the general scope of this contract in the services to be performed.
- (b) If any such change causes an increase or decrease in the cost of, or the time required for, performance of any part of the work under this contract, whether or not changed by the order, the Contracting Officer shall make an equitable adjustment in the contract price, the delivery schedule, or both, and shall modify the contract.
- (c) The Contractor must assert its right to an adjustment under this clause within 30 days from the date of receipt of the written order. However, if the Contracting Officer decides that the facts justify it, the Contracting Officer may receive and act upon a proposal submitted before final payment of the contract.

(d) If the Contractor's proposal includes the cost of property made obsolete or excess by the change, the Contracting Officer shall have the right to prescribe the manner of the disposition of the property.

(e) Failure to agree to any adjustment shall be a dispute under the Disputes clause. However, nothing in this clause shall excuse the Contractor from proceeding with the contract as changed.

(f) No services for which an additional cost or fee will be charged by the Contractor shall be furnished without the prior written authorization of the Contracting Officer. (End of clause)

121. FAR 52.243-4 CHANGES (AUG 1987)

(a) The Contracting Officer may, at any time, without notice to the sureties, if any, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract, including changes--

- (1) In the specifications (including drawings and designs);
- (2) In the method or manner of performance of the work;
- (3) In the Government-furnished facilities, equipment, materials, services, or site; or
- (4) Directing acceleration in the performance of the work.

(b) Any other written or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating

- (1) the date, circumstances, and source of the order and
- (2) that the Contractor regards the order as a change order.

(c) Except as provided in this clause, no order, statement, or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.

(d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for an adjustment based on defective specifications, no adjustment for any change under paragraph (b) of this clause shall be made for any costs incurred more than 20 days before the Contractor gives written notice as required. In the case of defective specifications for which the Government is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.

(e) The Contractor must assert its right to an adjustment under this clause within 30 days after

- (1) receipt of a written change order under paragraph (a) of this clause or
- (2) the furnishing of a written notice under paragraph (b) of this clause, by submitting to the

Contracting Officer a written statement describing the general nature and amount of the proposal, unless this period is extended by the Government. The statement of proposal for adjustment may be included in the notice under paragraph (b) above.

(f) No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

122. DFARS 252.243-7001 PRICING OF CONTRACT MODIFICATIONS (DEC 1991)

When costs are a factor in any price adjustment under this contract, the contract cost principles and procedures in FAR Part 31 and DRARS Part 231, in effect on the date of this contract, apply.

123. DFARS 252.243-7002 REQUESTS FOR EQUITABLE ADJUSTMENT (MAR 1998)

(a) The amount of any request for equitable adjustment to contract terms shall accurately reflect the contract adjustment for which the Contractor believes the Government is liable. The request shall include only costs for performing the change, and shall not include any costs that already have been reimbursed or that have been

separately claimed. All indirect costs included in the request shall be properly allocable to the change in accordance with applicable acquisition regulations.

(b) In accordance with 10 U.S.C. 2410(a), any request for equitable adjustment to contract terms that exceeds the simplified acquisition threshold shall bear, at the time of submission, the following certificate executed by an individual authorized to certify the request on behalf of the Contractor:

I certify that the request is made in good faith, and that the supporting data are accurate and complete to the best of my knowledge and belief.

(Official's Name)

(Title)

(c) The certification in paragraph (b) of this clause requires full disclosure of all relevant facts, including--

(1) Cost or pricing data if required in accordance with subsection 15.403-4 of the Federal Acquisition Regulation; and

(2) Information other than cost or pricing data, in accordance with subsection 15.403-3 of the FAR, including actual cost data and data to support any estimated costs, even if cost or pricing data are not required.

(d) The certification requirement in paragraph (b) of this clause does not apply to----

(1) Requests for routine contract payments; for example, requests for payment for accepted supplies and services, routine vouchers under a cost-reimbursement type contract, or progress payment invoices; or

(2) Final adjustment under an incentive provision of the contract.

(End of clause)

124. *FAR 52.244-2 SUBCONTRACTS (AUG 1998)

(a) Definitions. As used in this clause--

"Approved purchasing system" means a Contractor's purchasing system that has been reviewed and approved in accordance with Part 44 of the Federal Acquisition Regulation (FAR).

"Consent of subcontract" means the Contracting Officer's written consent for the Contractor to enter into a particular subcontract.

"Subcontract," means any contract, as defined in FAR Subpart 2.1, entered into by a subcontractor to furnish supplies or services for performance of the prime contract or a subcontract. It includes, but is not limited to purchase orders, and changes and modifications to purchase orders.

(b) This clause does not apply to subcontracts for special test equipment when the contract contains the clause at FAR 52.245-18, Special Test Equipment.

(c) When this clause is included in a fixed-price type contract, consent to subcontract is required only on unpriced contract actions (including unpriced modification or unpriced delivery orders), and only if required in accordance with paragraph (d) or (e) of this clause.

(d) If the Contractor does not have an approved purchasing system, consent to subcontract is required for any subcontract that--

(1) Is of the cost-reimbursement, time-and-materials, or labor-hour type; or

(2) Is fixed-price and exceeds--

(i) For a contract awarded by the Department of Defense, the Coast Guard, or the National Aeronautics and Space Administration, the greater of the simplified threshold or 5 percent of the total estimated cost of the contract; or

(ii) For a contract awarded by a civilian agency other than the Coast Guard and the National Aeronautics and Space Administration, either the simplified threshold or 5 percent of the total estimated cost of the contract.

(e) If the Contractor has an approved purchasing system, the Contractor nevertheless shall obtain the Contracting Officer's written consent before placing the following subcontracts:

(f)(1) The Contractor shall notify the Contracting Officer reasonably in advance of placing any subcontract or modification thereof for which consent is required under paragraph (c), (d), or (e) of this clause, including the following information:

(i) A description of the supplies or services to be subcontracted.

(ii) Identification of the type of subcontract to be used.

(iii) Identification of the proposed subcontractor.

(iv) The proposed subcontract price.

(v) The subcontractor's current, complete, and accurate cost or pricing data and Certificate of Current Cost or Pricing Data, if required by other contract provisions.

(vi) The subcontractor's Disclosure Statement or Certificate relating to Cost Accounting Standards when such data are required by other provisions of this contract.

(vii) A negotiation memorandum reflecting--

(A) The principal elements of the subcontract price negotiations;

(B) The most significant considerations controlling establishment of initial or revised prices;

(C) The reason cost or pricing data were or were not required;

(D) The extent, if any, to which the Contractor did not rely on the subcontractor's cost or pricing data in determining the price objective and in negotiating the final price;

(E) The extent to which it was recognized in the negotiation that the subcontractor's cost or pricing data were not accurate, complete, or current; the action taken by the Contractor and subcontractor; and the effect of any such defective data on the total price negotiated;

(F) The reasons for any significant difference between the Contractor's price objective and the price negotiated; and

(G) A complete explanation of the incentive fee or profit plan when incentives are used. The explanation shall identify each critical performance element, management decisions used to quantify each incentive element, reasons for the incentives, and a summary of all trade-off possibilities considered.

(2) The Contractor is not required to notify the Contracting Officer in advance of entering into any subcontract for which consent is not required under paragraph (c), (d), or (e) of this clause.

(g) Unless the consent or approval specifically provides otherwise, neither consent by the Contracting Officer to any subcontract nor approval of the Contractor's purchasing system shall constitute a determination--

(1) Of the acceptability of any subcontract terms or conditions;

(2) Of the acceptability of any cost under this contract; or

(3) To relieve the Contractor of any responsibility for performing this contract.

(h) No subcontract or modification thereof placed under this contract shall provide for payment on a cost-plus-a-percentage-of-cost basis, and any fee payable under cost-reimbursement subcontracts shall not exceed the fee limitations in FAR 15.404-4(c)(4)(i).

(i) The Contractor shall give the Contracting Officer immediate written notice of any action or suit filed and prompt notice of any claim made against the Contractor by any subcontractor or vendor that, in the opinion of the Contractor, may result in litigation related in any way to this contract, with respect to which the Contractor may be entitled to reimbursement by the Government.

(j) The Government reserves the right to review the Contractor's purchasing system as set forth in FAR Subpart 44.3.

(k) Paragraphs (d) and (f) of this clause do not apply to the following subcontracts, which were evaluated during negotiations:

(End of clause)

125. *FAR 52.244-4 SUBCONTRACTORS AND OUTSIDE ASSOCIATES AND CONSULTANTS (ARCHITECT-ENGINEER SERVICES) (AUG 1998)

Any subcontractors and outside associates or consultants required by the Contractor in connection with the services covered by the contract will be limited to individuals or firms that were specifically identified and agreed to during negotiations. The Contractor shall obtain the Contracting Officer's written consent before making any substitution for these subcontractors, associates, or consultants. (End of clause)

126. FAR 52.244-6 SUBCONTRACTS FOR COMMERCIAL ITEMS (MAY 2001)

(a) *Definitions.* As used in this clause—

“Commercial item” has the meaning contained in the clause at 52.202-1, Definitions.

“Subcontract” includes a transfer of commercial items between divisions, subsidiaries, or affiliates of the Contractor or subcontractor at any tier.

(b) To the maximum extent practicable, the Contractor shall incorporate, and require its subcontractors at all tiers to incorporate, commercial items or nondevelopmental items as components of items to be supplied under this contract.

(c)(1) The following clauses shall be flowed down to subcontracts for commercial items:

(i) 52.219-8, Utilization of Small Business Concerns (OCT 2000) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds \$500,000 (\$1,000,000 for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer sub-contracting opportunities.

(ii) 52.222-26, Equal Opportunity (FEB 1999) (E.O. 11246).

(iii) 52.222-35, Affirmative Action for Disabled Veterans and Veterans of the Vietnam Era (APR 1998) (38 U.S.C. 4212(a)).

(iv) 52.222-36, Affirmative Action for Workers with Disabilities (JUN 1998) (29 U.S.C. 793).

(v) 52.247-64, Preference for Privately Owned U.S.-Flagged Commercial Vessels (JUN 2000) (46 U.S.C. Appx 1241) (flowdown not required for subcontracts awarded beginning May 1, 1996).

(2) While not required, the Contractor may flow down to subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

(d) The Contractor shall include the terms of this clause, including this paragraph (d), in subcontracts awarded under this contract.

(End of clause)

127. *FAR 52.245-2 GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS) (DEC 1989) [For Government Property over \$100,000]

(a) Government-furnished property.

(1) The Government shall deliver to the Contractor, for use in connection with and under the terms of this contract, the Government-furnished property described in the Schedule or specifications together with any related data and information that the Contractor may request and is reasonably required for the intended use of the property (hereinafter referred to as "Government-furnished property").

(2) The delivery or performance dates for this contract are based upon the expectation that Government-furnished property suitable for use (except for property furnished "as is") will be delivered to the Contractor at the times stated in the Schedule or, if not so stated, in sufficient time to enable the Contractor to meet the contract's delivery or performance dates.

(3) If Government-furnished property is received by the Contractor in a condition not suitable for the intended use, the Contractor shall, upon receipt of it, notify the Contracting Officer, detailing the facts, and, as directed by the Contracting Officer and at Government expense, either repair, modify, return, or otherwise dispose of the property. After completing the directed action and upon written request of the Contractor, the Contracting Officer shall make an equitable adjustment as provided in paragraph (h) of this clause.

(4) If Government-furnished property is not delivered to the Contractor by the required time, the Contracting Officer shall, upon the Contractor's timely written request, make a determination of the delay, if any, caused the Contractor and shall make an equitable adjustment in accordance with paragraph (h) of this clause.

(b) Changes in Government-furnished property.

(1) The Contracting Officer may, by written notice,

(i) decrease the Government-furnished property provided or to be provided under this contract, or
(ii) substitute other Government-furnished property for the property to be provided by the Government, or to be acquired by the Contractor for the Government, under this contract. The Contractor shall promptly take such action as the Contracting Officer may direct regarding the removal, shipment, or disposal of the property covered by such notice.

(2) Upon the Contractor's written request, the Contracting Officer shall make an equitable adjustment to the contract in accordance with paragraph (h) of this clause, if the Government has agreed in the Schedule to make the property available for performing this contract and there is any--

(i) Decrease or substitution in this property pursuant to subparagraph (b)(1) above;
or
(ii) Withdrawal of authority to use this property, if provided under any other contract or lease.

(c) Title in Government property. (1) The Government shall retain title to all Government-furnished property.

(2) All Government-furnished property and all property acquired by the Contractor, title to which vests in the Government under this paragraph (collectively referred to as "Government property"), are subject to the provisions of this clause. However, special tooling accountable to this contract is subject to the provisions of the Special Tooling clause and is not subject to the provisions of this clause. Title to Government property shall not be affected by its incorporation into or attachment to any property not owned by the Government, nor shall government property become a fixture or lose its identity as personal property by being attached to any real property.

(3) Title to each item of facilities and special test equipment acquired by the Contractor for the Government under this contract shall pass to and vest in the Government when its use in performing this contract commences or when the Government has paid for it, whichever is earlier, whether or not title previously vested in the Government.

(4) If this contract contains a provision directing the Contractor to purchase material for which the Government will reimburse the Contractor as a direct item of cost under this contract--

(i) Title to material purchased from a vendor shall pass to and vest in the Government upon the vendor's delivery of such material; and
(ii) Title to all other material shall pass to and vest in the Government upon--

- (A) Issuance of the material for use in contract performance;
- (B) Commencement of processing of the material or its use in contract performance; or
- (C) Reimbursement of the cost of the material by the Government, whichever occurs first.
- (d) Use of Government property. The Government property shall be used only for performing this contract, unless otherwise provided in this contract or approved by the Contracting Officer.
- (e) Property Administration.
 - (1) The Contractor shall be responsible and accountable for all Government property provided under this contract and shall comply with Federal Acquisition Regulation (FAR) Subpart 45.5, as in effect on the date of this contract.
 - (2) The Contractor shall establish and maintain a program for the use, maintenance, repair, protection, and preservation of Government property in accordance with sound industrial practice and the applicable provisions of Subpart 45.5 of the FAR.
 - (3) If damage occurs to Government property, the risk of which has been assumed by the Government under this contract, the Government shall replace the items or the Contractor shall make such repairs as the Government directs. However, if the Contractor cannot effect such repairs within the time required, the Contractor shall dispose of the property as directed by the Contracting Officer. When any property for which the Government is responsible is replaced or repaired, the Contracting Officer shall make an equitable adjustment in accordance with paragraph (h) of this clause.
 - (4) The Contractor represents that the contract price does not include any amount for repairs or replacement for which the Government is responsible. Repair or replacement of property for which the Contractor is responsible shall be accomplished by the Contractor at its own expense.
- (f) Access. The Government and all its designees shall have access at all reasonable times to the premises in which any Government property is located for the purpose of inspecting the Government property.
- (g) Risk of loss. Unless otherwise provided in this contract, the Contractor assumes the risk of, and shall be responsible for, any loss or destruction of, or damage to, Government property upon its delivery to the Contractor or upon passage of title to the Government under paragraph (c) of this clause. However, the Contractor is not responsible for reasonable wear and tear to Government property or for Government property properly consumed in performing this contract.
- (h) Equitable adjustment. When this clause specifies an equitable adjustment, it shall be made to any affected contract provision in accordance with the procedures of the Changes clause. When appropriate, the Contracting Officer may initiate an equitable adjustment in favor of the Government. The right to an equitable adjustment shall be the Contractor's exclusive remedy. The Government shall not be liable to suit for breach of contract for--
 - (1) Any delay in delivery of Government-furnished property;
 - (2) Delivery of Government-furnished property in a condition not suitable for its intended use;
 - (3) A decrease in or substitution of Government-furnished property; or
 - (4) Failure to repair or replace Government property for which the Government is responsible.
- (i) Final accounting and disposition of Government property. Upon completing this contract, or at such earlier dates as may be fixed by the Contracting Officer, the Contractor shall submit, in a form acceptable to the Contracting Officer, inventory schedules covering all items of Government property (including any resulting scrap) not consumed in performing this contract or delivered to the Government. The Contractor shall prepare for shipment, deliver f.o.b. origin, or dispose of the Government property as may be directed or authorized by the Contracting Officer. The net proceeds of any such disposal shall be credited to the contract price or shall be paid to the Government as the Contracting Officer directs.
- (j) Abandonment and restoration of Contractor's premises. Unless otherwise provided herein, the Government--
 - (1) May abandon any Government property in place, at which time all obligations of the Government regarding such abandoned property shall cease; and
 - (2) Has no obligation to restore or rehabilitate the Contractor's premises under any circumstances (e.g., abandonment, disposition upon completion of need, or upon contract completion). However, if the Government-furnished property (listed in the Schedule or specifications) is withdrawn or is unsuitable for the

intended use, or if other Government property is substituted, then the equitable adjustment under paragraph (h) of this clause may properly include restoration or rehabilitation costs.

(k) Communications. All communications under this clause shall be in writing.

(l) Overseas contracts. If this contract is to be performed outside of the United States of America, its territories, or possessions, the words "Government" and "Government-furnished" (wherever they appear in this clause) shall be construed as "United States Government" and "United States Government-furnished," respectively.

128. *FAR 52.245-4 GOVERNMENT-FURNISHED PROPERTY (SHORT FORM) (APR 1984)
[For Government Property \$100,000 or Less]

(a) The Government shall delivery to the Contractor, at the time and locations stated in this contract, the Government-furnished property described in the Schedule or specifications. If that property, suitable for its intended use, is not delivered to the Contractor, the Contracting Officer shall equitably adjust affected provisions of this contract in accordance with the Changed clause when--

(1) The Contractor submits a timely written request for an equitable adjustment; and

(2) The facts warrant an equitable adjustment.

(b) Title to Government-furnished property shall remain in the Government. The Contractor shall use the Government-furnished property only in connection with this contract. The Contractor shall maintain adequate property control records in accordance with sound industrial practice and will make such records available for Government inspection at all reasonable times, unless the clause at Federal Acquisition Regulation 52.245-1, Property Records, is included in this contract.

(c) Upon delivery of Government-furnished property to the Contractor, the Contractor assumes the risk and responsibility for its loss or damage, except--

(1) For reasonable wear and tear;

(2) To the extent property is consumed in performing this contract; or

(3) As otherwise provided for by the provisions of this contract.

(d) Upon completing this contract, the Contractor shall follow the instructions of the Contracting Officer regarding the disposition of all Government-furnished property not consumed in performing this contract or previously delivered to the Government. The Contractor shall prepare for shipment, deliver f.o.b. origin, or dispose of the Government property, as may be directed or authorized by the Contracting Officer. The net proceeds of any such disposal shall be credited to the contract price or shall be paid to the Government as directed by the Contracting Officer.

(e) If this contract is to be performed outside the United States of America, its territories, or possessions, the words "Government" and "Government-furnished" (wherever they appear in this clause) shall be construed as "United States Government" and "United States Government-furnished," respectively.

129. *FAR 52.246-12 INSPECTION OF CONSTRUCTION (AUG 1996)

(a) Definition. "Work" includes, but is not limited to, materials, workmanship, and manufacture and fabrication of components.

(b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. The Contractor shall maintain complete inspection records and make them available to the Government. All work shall be conducted under the general direction of the Contracting Officer and is subject to Government inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.

(c) Government inspections and tests are for the sole benefit of the Government and do not--

(1) Relieve the Contractor of responsibility for providing adequate quality control measures;

(2) Relieve the Contractor of responsibility for damage to or loss of the material before acceptance;

(3) Constitute or imply acceptance; or

(4) Affect the continuing rights of the Government after acceptance of the completed work under paragraph (i) below.

(d) The presence or absence of a Government inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specification without the Contracting Officer's written authorization.

(e) The Contractor shall promptly furnish, at no increase in contract price, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. The Government may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. The Government shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

(f) The Contractor shall, without charge, replace or correct work found by the Government not to conform to contract requirements, unless in the public interest the Government consents to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

(g) If the Contractor does not promptly replace or correct rejected work, the Government may
(1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor
or

(2) Terminate for default the Contractor's right to proceed.

(h) If, before acceptance of the entire work, the Government decides to examine already completed work by removing it or tearing it out, the Contractor, on request, shall promptly furnish all necessary facilities, labor, and material. If the work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray the expenses of the examination and of satisfactory reconstruction. However, if the work is found to meet contract requirements, the Contracting Officer shall make an equitable adjustment for the additional services involved in the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.

(i) Unless otherwise specified in the contract, the Government shall accept, as promptly as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the Government's rights under any warranty or guarantee.

130. *FAR 52.246-21 WARRANTY OF CONSTRUCTION (MAR 1994)

(a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

(b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government -owned or controlled real or personal property, when that damage is the result of --

(1) The Contractor's failure to conform to contract requirements; or

(2) Any defect of equipment, material, workmanship, or design furnished.

(d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

(e) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.

(f) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(g) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall --

(1) Obtain all warranties that would be given in normal commercial practice ;

(2) Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and

(3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(h) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(i) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government -furnished material or design.

(j) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

131. DFARS 252.247-7023 TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)

(a) Definitions.

As used in this clause--

(1) "Components" means articles, materials, and supplies incorporated directly into end products at any level of manufacture, fabrication, or assembly by the Contractor or any subcontractor.

(2) "Department of Defense" (DOD) means the Army, Navy, Air Force, Marine Corps, and defense agencies.

(3) "Foreign flag vessel" means any vessel that is not a U.S.-flag vessel.

(4) "Ocean transportation" means any transportation aboard a ship, vessel, boat, barge, or ferry through international waters.

(5) "Subcontractor" means a supplier, materialman, distributor, or vendor at any level below the prime Contractor whose contractual obligation to perform results from, or is conditioned upon, award of the prime contract and who is performing any part of the work or other requirement of the prime contract.

(6) "Supplies" means all property, except land and interests in land, that is clearly identifiable for eventual use by or owned by the DoD at the time of transportation by sea.

(i) An item is clearly identifiable for eventual use by the DoD if, for example, the contract documentation contains a reference to a DoD contract number or a military destination.

(ii) "Supplies" includes (but is not limited to) public works; buildings and facilities; ships; floating equipment and vessels of every character, type, and description, with parts, subassemblies, accessories, and equipment; machine tools; material; equipment; stores of all kinds; end items; construction materials; and components of the foregoing.

(7) "U.S.-flag vessel" means a vessel of the United States or belonging to the United States, including any vessel registered or having national status under the laws of the United States.

(b) (1) The Contractor shall use U.S. -flag vessels when transporting any supplies by sea under this contract.

(2) A subcontractor transporting supplies by sea under this contract shall use U.S.-flag vessel if--

(i) This Contract is a construction contract; or

(ii) The supplies being transported are--

(A) Noncommercial items; or

(B) Commercial items that--

(1) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it subcontracts for f.o.b. destination shipment);

(2) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or

(3) Are commissary or exchange cargoes transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.

(c) The Contractor and its subcontractors may request that the Contracting Officer authorize shipment in foreign-flag vessels, or designate available U.S.-flag vessels, if the Contractor or a subcontractor believes that--

(1) U.S.-flag vessels are not available for timely shipment;

(2) The freight charges are inordinately excessive or unreasonable; or

(3) Freight charges are higher than charges to private persons for transportation of like goods.

(d) The Contractor must submit any request for use of other than U.S.-flag vessels in writing to the Contracting Officer at least 45 days prior to the sailing date necessary to meet its delivery schedules. The Contracting Officer will process requests submitted after such date(s) as expeditiously as possible, but the Contracting Officer's failure to grant approvals to meet the shipper's sailing date will not of itself constitute a compensable delay under this or any other clause of this contract. Requests shall contain at a minimum--

(1) Type, weight, and cube of cargo;

(2) Required shipping date;

(3) Special handling and discharge requirements;

(4) Loading and discharge points;

(5) Name of shipper and consignee;

(6) Prime contract number, and

(7) A documented description of efforts made to secure U.S.-flag vessels, including points of contact (with names and telephone numbers) with at least two U.S.-flag carriers contacted. Copies of telephone notes, telegraphic and facsimile message or letters will be sufficient for this purpose.

(e) The Contractor shall, within 30 days after each shipment covered by this clause, provide the Contracting Officer and the Division of National Cargo, Office of Market Development, Maritime Administration, U.S. Department of Transportation, Washington, DC 20590, one copy of the rated on board vessel operating carrier's ocean bill of lading, which shall contain the following information--

(1) Prime contract number;

(2) Name of vessel;

(3) Vessel flag of registry;

(4) Date of loading;

(5) Port of loading;

(6) Port of final discharge;

(7) Description of commodity;

(8) Gross weight in pounds and cubic feet if available;

(9) Total ocean freight in U.S. dollars; and

(10) Name of the steamship company.

(f) The Contractor agrees to provide with its final invoice under this contract a representation that to the best of its knowledge and belief--

(1) No ocean transportation was used in the performance of this contract;

(2) Ocean transportation was used and only U.S.-flag vessels were used for all ocean shipments under the contract;

(3) Ocean transportation was used, and the Contractor had the written consent of the Contracting Officer for all non-U.S.-flag ocean transportation; or

(4) Ocean transportation was used and some or all of the shipments were made on non-U.S.-flag vessels without the written consent of the Contracting Officer. The Contractor shall describe these shipments in the following format;

ITEM DESCRIPTION	CONTRACT LINE ITEMS	QUANTITY
---------------------	------------------------	----------

TOTAL

(g) If the final invoice does not include the required representation, the Government will reject and return it to the Contractor as an improper invoice for the purposes of the Prompt Payment clause of this contract. In the event there has been unauthorized use of non-U.S.-flag vessels in the performance of this contract, the Contracting Officer is entitled to equitably adjust the contract, based on the unauthorized use.

(h) The Contractor shall include this clause, including this paragraph (h) in all subcontracts under this contract that-

- (1) Exceed the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation; and
- (2) Are for a type of supplies described in paragraph (b) (2) of this clause.

132. DFARS 252.247-7024 NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)

(a) The Contractor has indicated by the response to the solicitation provision, Representation of Extent of Transportation by Sea, that it did not anticipate transporting by sea any supplies. If, however, after the award of this contract, the Contractor learns that supplies, as defined in the Transportation of Supplies by Sea clause of this contract, will be transported by sea, the Contractor--

- (1) Shall notify the Contracting Officer of that fact; and
- (2) Hereby agrees to comply with all the terms and conditions of the Transportation of Supplies by Sea clause of this contract.

(b) (1) The Contractor shall use U.S. -flag vessels when transporting any supplies by sea under this contract.

(2) A subcontractor transporting supplies by sea under this contract shall use U.S.-flag vessel if--

(i) This Contract is a construction contract; or

(ii) The supplies being transported are-

(A) Noncommercial items; or

(B) Commercial items that-

- (1) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it subcontracts for f.o.b. destination shipment);
- (2) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or
- (3) Are commissary or exchange cargoes transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.

**133. ~~DELETED FAR 52.248-3~~ ~~VALUE ENGINEERING—CONSTRUCTION (FEB 2000)~~
~~(ALERNATE I (APR 1984))~~**

(a) ~~General.~~ The Contractor is encouraged to develop, prepare, and submit value engineering change proposals (VECP's) voluntarily. The Contractor shall share in any instant contract savings realized from accepted VECP's, in accordance with paragraph (f) of this clause.

(b) ~~Definitions.~~ "Collateral costs," as used in this clause, means agency costs of operation, maintenance, logistic support, or Government furnished property.

"Collateral savings," as used in this clause, means those measurable net reductions resulting from a VECP in the agency's overall projected collateral costs, exclusive of acquisition savings, whether or not the acquisition cost changes.

"Contractor's development and implementation costs," as used in this clause, means those costs the Contractor incurs on a VECP specifically in developing, testing, preparing, and submitting the VECP, as well as those costs the Contractor incurs to make the contractual changes required by Government acceptance of a VECP.

"Government costs," as used in this clause, means those agency costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistic support. The term does not include the normal administrative costs of processing the VECP.

"Instant contract savings," as used in this clause, means the estimated reduction in Contractor cost of performance resulting from acceptance of the VECP, minus allowable Contractor's development and implementation costs, including subcontractors' development and implementation costs (see paragraph (h) of this clause).

"Value engineering change proposal (VECP)" means a proposal that—

(1) ~~Requires a change to this, the instant contract, to implement; and~~

(2) ~~Results in reducing the contract price or estimated cost without impairing essential functions or characteristics; provided, that it does not involve a change—~~

(i) ~~In deliverable end item quantities only; or~~

(ii) ~~To the contract type only.~~

(c) ~~VECP preparation.~~ As a minimum, the Contractor shall include in each VECP the information described in paragraphs (c) (1) through (7) of this clause. If the proposed change is affected by contractually required configuration management or similar procedures, the instructions in those procedures relating to format, identification, and priority assignment shall govern VECP preparation. The VECP shall include the following:

(1) ~~A description of the difference between the existing contract requirement and that proposed, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, and the effect of the change on the end item's performance.~~

(2) ~~A list and analysis of the contract requirements that must be changed if the VECP is accepted, including any suggested specification revisions.~~

(3) ~~A separate, detailed cost estimate for~~

(i) ~~the affected portions of the existing contract requirement and~~

(ii) ~~the VECP. The cost reduction associated with the VECP shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts under paragraph (h) of this clause.~~

(4) ~~A description and estimate of costs the Government may incur in implementing the VECP, such as test and evaluation and operating and support costs.~~

(5) ~~A prediction of any effects the proposed change would have on collateral costs to the agency.~~

(6) ~~A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.~~

(7) ~~Identification of any previous submissions of the VECP, including the dates submitted, the agencies and contract numbers involved, and previous Government actions, if known.~~

(d) ~~Submission.~~ The Contractor shall submit VECP's to the Resident Engineer at the worksite, with a copy to the Contracting Officer.

(e) ~~Government action.~~

~~(1) The Contracting Officer will notify the Contractor of the status of the VECP within 45 calendar days after the contracting office receives it. If additional time is required, the Contracting Officer will notify the Contractor within the 45-day period and provide the reason for the delay and the expected date of the decision. The Government will process VECP's expeditiously; however, it will not be liable for any delay in acting upon a VECP.~~

~~(2) If the VECP is not accepted, the Contracting Officer will notify the Contractor in writing, explaining the reasons for rejection. The Contractor may withdraw any VECP, in whole or in part, at any time before it is accepted by the Government. The Contracting Officer may require that the Contractor provide written notification before undertaking significant expenditures for VECP effort.~~

~~(3) Any VECP may be accepted, in whole or in part, by the Contracting Officer's award of a modification to this contract citing this clause. The Contracting Officer may accept the VECP, even though an agreement on price reduction has not been reached, by issuing the Contractor a notice to proceed with the change. Until a notice to proceed is issued or a contract modification applied a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The decision to accept or reject all or part of any VECP is a unilateral decision made solely at the discretion of the Contracting Officer.~~

~~(f) Sharing.~~

~~(1) Rates. The Government's share of savings is determined by subtracting Government costs from instant contract savings and multiplying the result by~~

~~(i) 45 percent for fixed-price contracts or~~

~~(ii) 75 percent for cost reimbursement contracts.~~

~~(2) Payment. Payment of any share due the Contractor for use of a VECP on this contract shall be authorized by a modification to this contract to—~~

~~(i) Accept the VECP;~~

~~(ii) Reduce the contract price or estimated cost by the amount of instant contract savings; and~~

~~(iii) Provide the Contractor's share of savings by adding the amount calculated to the contract price or fee.~~

~~(g) Deleted.~~

~~(h) Subcontracts. The Contractor shall include an appropriate value engineering clause in any subcontract of \$50,000 or more and may include one in subcontracts of lesser value. In computing any adjustment in this contract's price under paragraph (f) of this clause, the Contractor's allowable development and implementation costs clearly resulting from a VECP accepted by the Government under this contract, but shall exclude any value engineering incentive payments to a subcontractor. The Contractor may choose any arrangement for subcontractor value engineering incentive payments; provided, that these payments shall not reduce the Government's share of the savings resulting from the VECP.~~

~~(i) Data. The Contractor may restrict the Government's right to use any part of a VECP or the supporting data by marking the following legend on the affected parts:~~

~~"These data, furnished under the Value Engineering Construction clause of contract —————, shall not be disclosed outside the Government or duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate a value engineering change proposal submitted under the clause. This restriction does not limit the Government's right to use information contained in these data if it has been obtained or is otherwise available from the Contractor or from another source without limitations."~~

~~If a VECP is accepted, the Contractor hereby grants the Government unlimited rights in the VECP and supporting data, except that, with respect to data qualifying and submitted as limited rights technical data, the Government shall have the rights specified in the contract modification implementing the VECP and shall appropriately mark the data. (The terms "unlimited rights" and "limited rights" are defined in Part 27 of the Federal Acquisition Regulation.)~~

~~————— (End of Clause)~~

(FIXED-PRICE) ALTERNATE I (SEP 1996) [For Contracts Over \$100,000]

(a) The Government may terminate performance of work under this contract in whole or, from time to time, in part if the Contracting Officer determines that a termination is in the Government's interest. The Contracting Officer shall terminate by delivering to the Contractor a Notice of Termination specifying the extent of termination and the effective date.

(b) After receipt of a Notice of Termination, and except as directed by the Contracting Officer, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due under this clause:

- (1) Stop work as specified in the notice.
- (2) Place no further subcontracts or orders (referred to as subcontracts in this clause) for materials, services, or facilities, except as necessary to complete the continued portion of the contract.
- (3) Terminate all subcontracts to the extent they relate to the work terminated.
- (4) Assign to the Government, as directed by the Contracting Officer, all right, title, and interest of the Contractor under the subcontracts terminated, in which case the Government shall have the right to settle or to pay any termination settlement proposal arising out of those terminations.
- (5) With approval or ratification to the extent required by the Contracting Officer, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts; the approval or ratification will be final for purposes of this clause.
- (6) As directed by the Contracting Officer, transfer title and deliver to the Government
 - (i) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced or acquired for the work terminated, and
 - (ii) the completed or partially completed plans, drawings, information, and other property that, if the contract had been completed, would be required to be furnished to the Government.
- (7) Complete performance of the work not terminated.
- (8) Take any action that may be necessary, or that the Contracting Officer may direct, for the protection and preservation of the property related to this contract that is in the possession of the Contractor and in which the Government has or may acquire an interest.
- (9) Use its best efforts to sell, as directed or authorized by the Contracting Officer, any property of the types referred to in subparagraph (b) (6) of this clause; provided, however, that the Contractor
 - (i) is not required to extend credit to any purchaser and
 - (ii) may acquire the property under the conditions prescribed by, and at prices approved by, the Contracting Officer. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the Government under this contract, credited to the price or cost of the work, or paid in any other manner directed by the Contracting Officer.

(c) The Contractor shall submit complete termination inventory schedules no later than 120 days from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 120-day period.

(d) After expiration of the plant clearance period as defined in Subpart 45.6 of the Federal Acquisition Regulation, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of termination inventory not previously disposed of, excluding items authorized for disposition by the Contracting Officer. The Contractor may request the Government to remove those items or enter into an agreement for their storage. Within 15 days, the Government will accept title to those items and remove them or enter into a storage agreement. The Contracting Officer may verify the list upon removal of the items, or if stored, within 45 days from submission of the list, and shall correct the list, as necessary, before final settlement.

(e) After termination, the Contractor shall submit a final termination settlement proposal to the Contracting Officer in the form and with the certification prescribed by the Contracting Officer. The Contractor shall submit the proposal promptly, but no later than 1 year from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 1 year period. However, if the Contracting Officer determines that the facts justify it, a termination settlement proposal may be received and acted on after 1 year or any extension. If the Contractor fails to submit the proposal within the time allowed, the Contracting Officer may determine, on the basis of information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.

(f) Subject to paragraph (e) of this clause, the Contractor and the Contracting Officer may agree upon the whole or any part of the amount to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. However, the agreed amount, whether under this paragraph (f) or paragraph (g) of this clause, exclusive of costs shown in subparagraph (g)(3) of this clause, may not exceed the total contract price as reduced by (1) the amount of payments previously made and (2) the contract price of work not terminated. The contract shall be amended, and the Contractor paid the agreed amount. Paragraph (f) of this clause shall not limit, restrict, or affect the amount that may be agreed upon to be paid under this paragraph.

(g) If the Contractor and the Contracting Officer fail to agree on the whole amount to be paid the Contractor because of the termination of work, the Contracting Officer shall pay the Contractor the amounts determined as follows, but without duplication of any amounts agreed upon under paragraph (f) of this clause:

(1) For contract work performed before the effective date of the termination, the total (without duplication of any items) of--

(i) The cost of this work;
(ii) The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the contract if not included in subdivision (g)(1)(i) of this clause; and
(iii) A sum, as profit on subdivision (g)(1)(i) of this clause, determined by the Contracting Officer under 49.202 of the Federal Acquisition Regulation, in effect on the date of this contract, to be fair and reasonable; however, if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, the Contracting Officer shall allow no profit under this subdivision (iii) and shall reduce the settlement to reflect the indicated rate of loss.

(2) The reasonable costs of settlement of the work terminated, including--
(i) Accounting, legal, clerical, and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data;
(ii) The termination and settlement of subcontracts (excluding the amounts of such settlements); and
(iii) Storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

(h) Except for normal spoilage, and except to the extent that the Government expressly assumed the risk of loss, the Contracting Officer shall exclude from the amounts payable to the Contractor under paragraph (g) of this clause, the fair value, as determined by the Contracting Officer, of property that is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government or to a buyer.

(i) The cost principles and procedures of Part 31 of the Federal Acquisition Regulation, in effect on the date of this contract, shall govern all costs claimed, agreed to, or determined under this clause.

(j) The Contractor shall have the right of appeal, under the Disputes clause, from any determination made by the Contracting Officer under paragraph (e), (g), or (l) of this clause, except that if the Contractor failed to submit the termination settlement proposal within the time provided in paragraph (e) or (l), respectively, and failed to request a time extension, there is no right of appeal.

(k) In arriving at the amount due the Contractor under this clause, there shall be deducted--
(1) All unliquidated advance or other payments to the Contractor under the terminated portion of this contract;

(2) Any claim which the Government has against the Contractor under this contract; and
(3) The agreed price for, or the proceeds of sale of, materials, supplies, or other things acquired by the Contractor or sold under the provisions of this clause and not recovered by or credited to the Government.

(l) If the termination is partial, the Contractor may file a proposal with the Contracting Officer for an equitable adjustment of the price(s) of the continued portion of the contract. The Contracting Officer shall make any equitable adjustment agreed upon. Any proposal by the Contractor for an equitable adjustment under this clause shall be requested within 90 days from the effective date of termination unless extended in writing by the Contracting Officer.

(m) (1) The Government may, under the terms and conditions it prescribes, make partial payments and payments against costs incurred by the Contractor for the terminated portion of the contract, if the Contracting Officer believes the total of these payments will not exceed the amount to which the Contractor will be entitled.

(2) If the total payments exceed the amount finally determined to be due, the Contractor shall repay the excess to the Government upon demand, together with interest computed at the rate established by the Secretary of the Treasury under 50 U.S.C. App. 1215(b)(2). Interest shall be computed for the period from the date the excess payment is received by the Contractor to the date the excess is repaid. Interest shall not be charged on any excess payment due to a reduction in the Contractor's termination settlement proposal because of retention or other disposition of termination inventory until 10 days after the date of the retention or disposition, or a later date determined by the Contracting Officer because of the circumstances.

(n) Unless otherwise provided in this contract or by statute, the Contractor shall maintain all records and documents relating to the terminated portion of this contract for 3 years after final settlement. This includes all books and other evidence bearing on the Contractor's costs and expenses under this contract. The Contractor shall make these records and documents available to the Government, at the Contractor's office, at all reasonable times, without any direct charge. If approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions may be maintained instead of original records and documents.

135. *FAR 52.249-10 DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984)

(a) If the Contractor refuses or fails to prosecute the work or any separable part, with the diligence that will insure its completion within the time specified in this contract including any extension, or fails to complete the work within this time, the Government may, by written notice to the Contractor, terminate the right to proceed with the work (or the separable part of the work) that has been delayed. In this event, the Government may take over the work and complete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the Government resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the Government in completing the work.

(b) The Contractor's right to proceed shall not be terminated nor the Contractor charged with damages under this clause, if-

(1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include

- (i) acts of God or of the public enemy,
- (ii) acts of the Government in either its sovereign or contractual capacity,
- (iii) acts of another Contractor in the performance of a contract with the Government,
- (iv) fires,
- (v) floods,
- (vi) epidemics,
- (vii) quarantine restrictions,
- (viii) strikes,
- (ix) freight embargoes,
- (x) unusually severe weather, or
- (xi) delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and

(2) The Contractor, within 10 days from the beginning of any delay (unless extended by the Contracting Officer), notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, the time for completing the work shall be extended. The findings of the Contracting Officer shall be final and conclusive on the parties, but subject to appeal under the Disputes clause.

(c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of the Government.

(d) The rights and remedies of the Government in this clause are in addition to any other rights and remedies provided by law or under this contract.

136. ENVIRONMENTAL LITIGATION (1974 NOV OCE)

(a) If the performance of all or any part of the work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation, as defined below, the Contracting Officer, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor or a Subcontractor at any tier not required by the terms of this contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a Subcontractor at any tier other than as required by the terms of this contract, such suspension, delay, or interruption shall be considered as if ordered by the Contracting Officer in the administration of this contract under the terms of the "Suspension of Work" clause of this contract. The period of such suspension, delay, or interruption shall be considered unreasonable, and an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) as provided in that clause, subject to all the provisions thereof.

(b) The term "environmental litigation," as used herein, means a lawsuit alleging that the work will have an adverse effect on the environment or that the Government has not duly considered, either substantively or procedurally, the effect of the work on the environment.

137. EFARS 52.249-5000 BASIS FOR SETTLEMENT OF PROPOSALS

Actual costs will be used to determine equipment cost for a settlement proposal submitted on the total cost basis under FAR 49.206-2(b). In evaluating a termination settlement proposal using the total cost basis, the following principles will be applied to determine allowable equipment costs:

(1) Actual costs for each piece of equipment, or groups of similar serial or series equipment, need not be available in the contractor's accounting records to determine total actual equipment costs.

(2) If equipment costs have been allocated to a contract using predetermined rates, those charges will be adjusted to actual costs.

(3) Recorded job costs adjusted for unallowable and unallocable expenses will be used to determine equipment operating expenses.

(4) Ownership costs (depreciation) will be determined using the contractor's depreciation schedule (subject to the provisions of FAR 31.205-11).

(5) License, taxes, storage and insurance costs are normally recovered as an indirect expense and unless the contractor charges these costs directly to contracts, they will be recovered through the indirect expense rate.

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SECTION 00800

SPECIAL CONTRACT REQUIREMENTS
5/00, Rev 8/00

PART 1 GENERAL

Attachments:

Project Sign Details OD15-9A12 and OD15-9A22
General Wage Decision Nos. CO010001 and CO010008
Contractor Employee Verification List"
AF Form 103, Base Civil Engineering Work Clearance Request

1.1 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall be required to (a) commence work under this contract within ten (10) calendar days after the date of receipt by him of Notice to Proceed, (b) prosecute said work diligently, and (c) complete the entire work ready for use not later than 540 calendar days (which includes design, design reviews and all construction activities) after notice to proceed. An additional 60 calendar days will be added to the completion time if Option O-1 is exercised. An additional 120 calendar days will be added to the completion time if Option O-5 is exercised. All other Options, if exercised, do not add additional time for completion of the contract. The time stated for completion of the project shall include final cleanup of the premises. (FAR 52.211-10)

1.1.1 Sequence of Design-Construction

(a) After receipt of the Contract Notice to Proceed (NTP), the Contractor shall initiate design, comply with all design submission requirements as covered in Division 01 General Requirements of the advertised Solicitation, and obtain Government review of each submission. No construction may be started until the Government reviews the 100 Percent Corrected Design submission and determines it satisfactory for purposes of beginning construction. The Contractor has the option to submit the design as an entirely complete design package (design analysis, plans and specifications) or as two (2) separate complete design packages (design analysis, plans and specifications), one for the site work and utilities and one for all other work. Each package will require the same design submittals, design reviews and design review conferences as set forth in the Contract. The Government will not grant any time extension for any design resubmittal required when, in the opinion of the Contracting Officer, the initial submission failed to meet the minimum quality requirements as set forth in the Contract.

(b) If the Government allows the Contractor to proceed with limited construction based on pending minor revisions to the reviewed 100 Percent Corrected Design submission, no payment will be made for any in-place construction related to the pending revisions until they are completed, resubmitted and are satisfactory to the Government.

1.2 LIQUIDATED DAMAGES-CONSTRUCTION (SEPT 2000)

(a) If the Contractor fails to complete the work within the time

specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount of \$790.00 for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause. (FAR 52.211-12)

1.3 EXCEPTION TO COMPLETION TIME AND LIQUIDATED DAMAGES

In case the Contracting Officer determines that seeding, sodding, and/or planting and/or the specified maintenance thereof is not feasible during the construction period, such work will be excepted from the completion time and liquidated damages. This work shall be accomplished during the first seeding, sodding, and/or planting period and the specified maintenance period following the completion date, and the warranty for that portion of the work will begin from the date that those plantings are accepted by the Government.

1.4 DESIGN-BUILD CONTRACT - ORDER OF PRECEDENCE

(a) The contract includes the standard contract clauses and schedules current at the time of contract award. It entails (1) the solicitation in its entirety, including all drawings, cuts, and illustrations, and any amendments, and (2) the successful offeror's accepted proposal. The contract constitutes and defines the entire agreement between the Contractor and the Government. No documentation shall be omitted which in any way bears upon the terms of that agreement.

(b) In the event of conflict or inconsistency between any of the provisions of this contract, precedence shall be given in the following order:

(1) Betterments: Any portion of the accepted proposal, which both conform to and exceed the provisions of the solicitation. "Betterment" is defined as any product, component, or system, which exceeds the requirements stated in the solicitation.

(2) The provisions of the solicitation. (See also Contract Clause entitled "SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION".)

(3) All other provisions of the accepted proposal.

(4) Any design products including, but not limited to, plans, specifications, engineering studies and analyses, shop drawings, equipment installation drawings, etc.. These are "deliverable" under the contract and are not part of the contract itself. Design products must conform with all the provisions of the contract, in the order of precedence herein.

(c) Where conflicts between the solicitation requirements and the UFGS guide specifications (available as indicated in Section 01332 Submittals During Design) exist, the solicitation requirements shall take precedence. Any installation requirements within the solicitation requirements, but not contained in the UFGS guide specifications, shall be added to the specifications or shown on the drawings.

1.5 RESPONSIBILITY OF THE CONTRACTOR FOR DESIGN

(a) The Contractor shall be responsible for the professional quality, technical accuracy, and the coordination of all designs, drawings, specifications, and any other non-construction services furnished by the Contractor under this contract. The Contractor shall, without additional compensation, correct or revise any errors or deficiency in its designs, drawings, specifications, and other non-construction services.

(b) Neither the Government's review, approval or acceptance of, nor payment for, the services required under this contract shall be construed to operate as a waiver of any rights under this contract or any cause of action arising out of the performance of this contract, and the Contractor shall be and remain liable to the Government in accordance with applicable law for all damages to the Government caused by the Contractor's negligent performance of any of the services described in paragraph (a) furnished under this contract.

(c) The rights and remedies of the Government provided under this contract are in addition to any other rights and remedies provided by law.

1.6 MISSION DELAY DAYS

The Contractor shall anticipate a work delay of up to four(4) days during the contract period due to Using Service operations. The Contractor will be notified one week in advance of these interruptions. This time is included in the overall completion time stated and no additional time or increase in the contract price will be allowed due to these delays. The Using Service Operations will affect the approval dates of all utility interruption, particularly electrical service.

1.7 RFP DRAWINGS AND SPECIFICATIONS

Within thirty (30) days after award of the contract, the Government will furnish the Contractor a CD-ROM containing the RFP drawings in an AutoCAD format, RFP technical criteria requirements/specifications in a Specsintact format and other miscellaneous items (amendments and attachments). For additional information, See Section 01332, SUBMITTAL DURING DESIGN.

1.8 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Equipment Room Drawings; G-RE.

This submittal is not required during construction, if equipment room drawings are shown on the 100 percent design submittal.

1.9 PHYSICAL DATA (APR 1984)

Data and information furnished or referred to below is for the Contractors' information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

a. The indications of physical conditions on the drawings and in the specifications are the result of site investigations by surveys and borings. The data shown graphically and by symbol for each respective boring represents the actual geologic features observed and logged at the location given on the drawings. While the borings are representative of subsurface conditions at their respective locations and for their respective vertical reaches, local minor variations characteristic of the subsurface materials of this region could occur.

b. Weather conditions shall have been investigated by the Contractor to satisfy himself as to the hazards likely to arise therefrom. Complete weather records and reports may be obtained from the local U.S. Weather Bureau.

c. Transportation facilities shall have been investigated by the Contractor to satisfy himself as to the existence of access highways and railroad facilities. (FAR 52.236-4)

1.10 CONCURRENT CONSTRUCTION

Construction work closely related to and/or located at the site of the work under a concurrent contract, including Administration Building Addition and Steamboat Avenue Reconstruction and BX. will be in progress simultaneously with work under this contract. The location(s) of this concurrent work is shown on the drawings or described in these specifications. The Contractor shall cooperate with others as necessary in the interest of timely completion of all work. In the event of interference, the Contracting Officer shall be notified immediately for resolution and his decision shall be final.

1.11 PAYMENT

1.11.1 PROMPT PAYMENT ACT

Pay requests authorized in CONTRACT CLAUSES clause: "Payments Under Fixed-Price Construction Contracts", will be paid pursuant to the clause, "Prompt Payment for Construction Contracts". Pay requests will be submitted on ENG Form 93 and 93a, "Payment Estimate-Contract Performance" and "Continuation". All information and substantiation required by the identified contract clauses will be submitted with the ENG Form 93, and the required certification will be included on the last page of the ENG Form 93a, signed by an authorized contractor official and dated when signed. The designated billing office is the Office of the Area Engineer.

1.11.2 PAYMENTS FOR MODIFICATIONS

Payments may be made for cost bearing change orders within the scope of the contract only to the extent funds are authorized in the order on a two-part modification. Contractor pricing proposed must be submitted at the earliest possible time after the change order is issued, or at a specific time as directed by the Contracting Officer. At the discretion of the Contracting Officer, any and all payments may be withheld on the modification until the Contractor has submitted a qualifying price proposal, in as much detail as required by the Contracting Officer, and the final price has been agreed.

1.11.3 PAYMENT FOR MATERIALS DELIVERED OFFSITE (MAR 1995)

a. Pursuant to FAR clause 52.232-5, Payments Under Fixed Priced Construction Contracts, materials delivered to the contractor at locations other than the site of the work may be taken into consideration in making payments if included in payment estimates and if all the conditions of the General Provisions are fulfilled. Payment for items delivered to locations other than the work site will be limited to: (1) materials required by the technical provisions; or (2) materials that have been fabricated to the point where they are identifiable to an item of work required under this contract.

b. Such payment will be made only after receipt of paid or receipted invoices or invoices with canceled check showing title to the items in the prime contractor and including the value of material and labor incorporated into the item. Payment for materials delivered off-site includes petroleum products. (List additional items for which payments will be made for off-site delivery.) (EFAR 52.232-5000)

1.12 AVAILABILITY OF UTILITY SERVICES

The Contractor shall arrange with the Buckley AFB Base Civil Engineer's Office for electricity required by him for construction under this project and shall meter and pay all costs in connection therewith. Reasonable amounts of domestic water will be made available to the Contractor by the Government from existing system outlets and supplies. The Contractor shall, at his own expense, make all temporary connections and install distribution lines. The Contractor shall furnish to the Contracting Officer a complete system layout drawing showing type of materials to be used and method of installation for all temporary electrical systems. All temporary lines shall be maintained by the Contractor in a workmanlike manner satisfactory to the Contracting Officer and shall be removed by the Contractor in like manner prior to final acceptance of the construction. Normal quantities of electricity and water used to make final tests of completely installed systems will be furnished by the Government.

1.12.1 Fire Hydrant Connections

Only compatible adapters shall be utilized for hydrant connections. A hydrant wrench of the correct size shall be used. A separate valve shall be installed on the hydrant for control of water by the Contractor. Temporary connections to fire hydrants shall be disconnected at the end of each working day. Connection shall include backflow protection. Notify Fire Department (340-9928) prior to connection.

1.13 UTILITY SERVICE INTERRUPTIONS

The Contractor shall submit written notification (not less than 15 calendar days, unless indicated otherwise) in advance of each interruption of each utility and communication service to or within existing buildings and facilities being used by others. The time and duration of all outages will be coordinated and approved in writing by the Contracting Officer.

1.13.1 SCHEDULING OF INTERRUPTIONS TO UTILITY SYSTEMS AND OPERATIONS

Special attention to the scheduling and performance of work that includes connections to existing utility and operating systems is required under this contract. Each item of work that includes a potential shutdown or interruption to the normal service or operations of any system or any other existing operating systems that may be affected by the work shall be

identified in the progress schedule. See Paragraph: Phasing Of Work above for additional requirements.

All service interruptions or outages must be scheduled with the Contracting Officer and shall be planned such that the length of the outage time is minimized. In his request for a service interruption, the Contractor shall submit to the Contracting Officer for approval a written plan detailing the procedures for disconnection and re-establishing utility services for each particular outage. This plan must include potential opportunities for fallback to original service during the process if any exist.

1.13.1.1 SCHEDULING SERVICE INTERRUPTIONS

The Contractor shall provide a proposed service interruption schedule within 30 days of Notice to Proceed of contract. The schedule shall indicate all required interruptions, the proposed dates of all interruption, and the number of crews/personnel to be used during each interruption. Unauthorized utility interruptions will not be tolerated.

a. Contractor Notification.

The Contractor may be notified as late as one calendar day prior to the proposed service interruption date as to whether or not the interruption will be permitted. Scheduled interruptions are subject to cancellation by Contracting Officer's Representative without prior notification. Service interruptions may be cancelled at anytime prior to starting the work associated with the interruption.

b. Work Requirements.

The materials and equipment required for the work to be accomplished during the interruption shall be complete and available on the job for review by the Contracting Officer three days prior to the shutdown. If the Contractor is not adequately prepared, the interruption will be cancelled and rescheduled. If rescheduling is required, it shall be at the Contractor's expense. Rescheduling requires 14 calendar days notice as if it were a new request. The rescheduling shall not affect the other planned interruptions, unless the first interruption is required in critical sequence to the second.

1.14 DIGGING PERMITS AND ROAD CLOSINGS

The Contractor shall be responsible for securing digging permits. The Contractor will be provided a blank AF Form 103 and shall be responsible for signatures and coordination with communications, fire department, plumbing shop, electrical shop, grounds shop, environmental, safety, security police, base operations and any affected public utility. Roads shall only be closed one lane at a time and vehicular traffic shall be allowed to pass through the construction area. Work on or near roadways shall be flagged in accordance with the safety requirements in Safety and Health Requirements Manual EM 385-1-1, which forms a part of these specifications.

1.15 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

a. This clause specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the

contract clause entitled "Default: (Fixed-Price Construction)." In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.

b. The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
(08)	(05)	(04)	(04)	(06)	(04)	(07)	(05)	(03)	(02)	(03)	(06)

c. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the contractor's scheduled work day. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph b. above, the contracting officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the contract clause entitled "Default (Fixed Price Construction)". (ER 415-1-15)

1.16 INSURANCE REQUIRED

In accordance with CONTRACT CLAUSES clause: "Insurance Work on a Government Installation," the Contractor shall procure the following minimum insurance:

Type	Amount
Workmen's Compensation and Employer's Liability Insurance	\$100,000
General Liability Insurance	\$500,000 per occurrence
Automobile Liability Insurance	
Bodily injury	\$200,000 per person and \$500,000 per occurrence
Property damage	\$ 20,000 per occurrence

(Coverages per FAR 28.307-2)

1.17 BASE ACCESS AND SECURITY

a. Each Contractor and Contractor employee to work on the job at Buckley must obtain a vehicle pass to enter the base. The pass will be obtained the first day of work at Buckley, or not later than the next working day. To obtain the vehicle pass, the vehicle operator must have in his possession, a current, valid driver's license, current vehicle registration, and current proof of insurance. Procedures for obtaining a base pass will be identified at the Pre-Construction Meeting. Expired/unregistered vehicles will not be allowed on the base. Employees who are terminated from employment will surrender any and all identification media and vehicle passes to their immediate supervisor, who will in turn surrender same to the Pass and ID Office, and the supervisor will immediately escort the terminated employee off base, and notify Base Police of the termination. Access to the Buckley AFB shall be through the Sixth Avenue Gate. The Contractor shall provided the Buckley AFB Base Security Police a copy of a completed "Contractor Employee Verification List" (Attachment No. 1), with is to include the names of all subcontractors and suppliers, and the names and social security numbers of all employees requiring access to the Base. The list shall be revised in its entirety and a new copy provided to the Buckley AFB Security Police as persons/companies are added and/or deleted.

b. All driver's on Buckley will have in their possession a valid driver's license, valid vehicle registration, and proof of vehicle insurance while operating any vehicle. If vehicle is registered to someone other than the operator, the operator must provide a notarized letter from the registered owner, authorizing the operator permission to operate the vehicle.

c. Contract Superintendent must notify Base Police through the Contracting Office prior to any work to be performed on non-scheduled hours/days (evenings, weekends, holidays). Any personnel working on non-scheduled hours/days must check in with Base Police, Bldg 940, prior to and at the completion of the work.

d. All equipment and materials are the responsibility of the Contractor. Make sure that all equipment and materials are properly secured at the end of the work day. Any work area found by Base Police to be unsecured will be checked for intruders and the responsible Contract Superintendent will be called in to secure the areas/equipment.

e. If any roadway is to be blocked for any reason, the Contractor must notify, through the Contracting Office, the Base Police of the blockage, prior to the blockage, and must insure that proper signs are installed to divert traffic around the affected area. As much lead time notification as possible is appreciated for proper coordination, and notification of other activities on base.

f. Contractors, Subcontractors and all personnel who report for work, and do not know the location of the job site, will be held at the main gate to await escort service from the Construction Superintendent.

g. Base speed limits are strictly enforced with the use of radar equipment. The base speed limit is 30 MPH, unless otherwise posted. The speed limit through the gates is 20 MPH. Motorcycle operator/riders must wear protective headgear (helmets) while riding on base. Mandatory

seatbelt laws are in effect on base. Seatbelts must be fastened prior to entering the base. All motor vehicle traffic must enter the base via the main gate, 6th Avenue.

h. No privately owned weapons or contraband (drugs, etc.) are permitted on any military installation, at any time. Violators will be prosecuted through the Federal Magistrates Court in Denver. Cameras are also considered to be contraband on this installation.

i. Buckley AFB is considered to be a closed facility. No unauthorized tours or visitors will be allowed on the installation.

j. Base Security Police emergency number is 340-9777. This number provided emergency police, fire, and ambulance service. For normal business, 24 hours a day, 7 days/week, call 340-9930/9931.

1.18 PARKING

Parking of the Contractor's and Contractor's employee's vehicles shall be restricted to the area as determined at the Pre-Construction meeting.

1.19 CONTRACTOR QUALITY CONTROL (CQC)

See Section 01451A Contractor Quality Control.

1.20 NONDOMESTIC CONSTRUCTION MATERIALS

The List of nondomestic construction materials or their components included in the list set forth in paragraph 25.104 of the Federal Acquisition Regulation does not apply to the requirements of the contract clause entitled "Buy American Act Construction Materials".

1.21 NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (SEP 1990)

Any contract awarded as a result of this solicitation will be a DO rated order certified for national defense use under the Defense Priorities and Allocations System (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation. (FAR 52.211-14)

1.22 DAILY WORK SCHEDULES

In order to closely coordinate work under this contract, the Contractor shall prepare a written agenda and attend a weekly coordination meeting with the Contracting Officer and Using Service at which time the Contractor shall submit for coordination and approval, his proposed daily work schedule for the next two week period. The Contractor shall provide a copy of modifications (MODs), Serial Letters, Requests for Information (RFIs) and any other information that is needed in the minutes of the meeting. Required temporary utility services, time and duration of interruptions, and protection of adjoining areas shall be included with the Contractor's proposed 2-week work schedule. At this meeting, the Contractor shall also submit his schedule of proposed dates and times of all preparatory inspections to be performed during the next 2 weeks. The items of work listed on the proposed 2-week schedule are to be keyed to the NAS by activity number and description for each activity anticipated to be performed during the next 2-week period. Coordination action by the Contracting Officer relative to these schedules will be accomplished during these weekly meetings. Daily reports shall be completed and given to the

Contracting Officer or Representative within 24 hours of work. The Contractor shall keep written minutes of these meetings and shall distribute copies to all attendees within three days of these meetings.

1.23 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (MAR 1995)

a. This statement shall become operative only for negotiated contracts where cost or pricing data is requested, and for modifications to sealed bid or negotiated contracts where cost or pricing data is requested. This clause does not apply to terminations. See 52.249-5000, Basis for settlement of proposals and FAR Part 49.

b. Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a Contractor or subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the Contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series of equipment from the Contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, "Construction Equipment Ownership and Operating Expense

Schedule," Region V. Copies of each regional schedule may be obtained through the following internet site:

<http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep.htm>. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the Contracting Officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be developed using the formula provided in the schedule. For forward pricing, the Schedule in effect at the time of negotiations shall apply. For retrospective pricing, the Schedule in effect at the time the work was performed shall apply.

c. Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36. Rates for equipment rented from an organization under common control, lease-purchase arrangements, and sale-leaseback arrangements will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees.

c. When actual equipment costs are proposed and the total amount of the pricing action exceeds the small purchase threshold, the contracting officer shall request the contractor to submit either certified cost or pricing data, or partial/limited data as appropriate. The data shall be submitted on Standard Form 1411, Contract Pricing Proposal Cover Sheet. (EFARS 52.231-5000)

1.24 AS-BUILT DRAWINGS

See SECTION 01040 - AS-BUILT DRAWINGS

1.25 SIGN

On commencement of work on this project, the Contractor shall furnish and erect the temporary sign in the location selected by the Contracting Officer near the project site. The Contractor shall maintain the sign in good condition through the project construction period. Upon completion of

the project the Contractor shall remove the sign from the premises. The project sign shall conform to Standard Drawing OD15-9A12 and OD15-9A22 bound herein. A decal of the "Engineer Castle" and the U. S. Air Force emblem will be furnished the Contractor upon request.

1.26 EQUIPMENT ROOM DRAWINGS

Prior to construction, the Contractor shall prepare and submit room plans (see paragraph SUBMITTALS for conditions regarding this submittal under Design/Build procurement) for all mechanical, electrical, and communication rooms or similar areas. The plans shall be consolidated for all trades, shall be to scale, and shall show all pertinent structural features. All equipment shall be accessible and laid out in a good design and workmanship manner and layouts for communications rooms shall be completed as early as possible. In addition, other items such as doors, windows, and cabinets required for installation and which will affect the available space, will be shown. All mechanical and electrical equipment and accessories shall be shown to scale in plan and elevation and/or section in their installed positions. All duct work and piping shall be shown.

1.27 CONTRACTOR FURNISHED EQUIPMENT DATA

See Section 01200 Warranty of Construction for Contractor Furnished Equipment Data to be submitted as part of the Warranty Equipment Booklet.

1.28 PERFORMANCE OF WORK BY CONTRACTOR (APR 1984)

The Contractor shall perform on the site, and with its own organization, work equivalent to at least twenty (20) percent of the total amount of work to be performed under the contract. This percentage may be reduced by a supplemental agreement to this contract if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the Government. (FAR 52.236-1)

1.29 PARTNERING

a. The Government intends to encourage the formation of a cohesive partnership with the Contractor. This partnership will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objective is effective contract performance in achieving completion within budget, on schedule and in accordance with plans and specifications. This partnership between the Contractor and the Government will be voluntary and its implementation will not be part of the contract requirements nor will it result in a change to contract price or terms.

b. It is anticipated that immediately after the preconstruction conference, the appropriate Contractor's key personnel and Government key personnel will attend a 1-day team building workshop. Follow-up workshops of 1 day duration may be held periodically throughout the duration of the contract as agreed to by the Contractor and the Government. Costs of the facilitator and facilities for the workshops will be shared equally by the participants.

1.30 PROFIT

a. Weighted guidelines method of determining profit shall be used on any equitable adjustment change order or modification issued under this

contract. The profit factors shall be as follows:

Factor	Rate	Weight	Value
Degree of Risk	20	See Item	
Relative difficulty of work	15	b. below	
Size of Job	15		
Period of performance	15		
Contractor's investment	5		
Assistance by Government	5		
Subcontracting	25		
	100		

b. Based on the circumstances of each procurement action, each of the above factors shall be weighted from .03 to .12 as indicated below. The value shall be obtained by multiplying the rate by the weight. The value column when totalled indicates the fair and reasonable profit percentage under the circumstances of the particular procurement.

(1) Degree of Risk. Where the work involves no risk or the degree of risk is very small, the weighting should be .03; as the degree of risk increases, the weighting should be increased up to a maximum of .12. Lump sum items will have, generally, a higher weighted value than the unit price items for which quantities are provided. Other things to consider: the portion of the work to be done by subcontractors, nature of work, where work is to be performed, reasonableness of negotiated costs, amount of labor included in costs, and whether the negotiation is before or after performance of work.

(2) Relative Difficulty of Work. If the work is most difficult and complex, the weighting should be .12 and should be proportionately reduced to .03 on the simplest of jobs. This factor is tied in to some extent with the degree of risk. Some things to consider: the nature of the work, by whom it is to be done, where, and what is the time schedule.

(3) Size of Job. All work not in excess of \$100,000 shall be weighted at .12. Work estimated between \$100,000 and \$5,000,000 shall be proportionately weighted from .12 to .05.

(4) Periods of Performance. Jobs in excess of 24 months are to be weighted at .12. Jobs of lesser duration are to be proportionately weighted to a minimum of .03 for jobs not to exceed 30 days. No weight where additional time not required.

(5) Contractor's Investment. To be weighted from .03 to .12 on the basis of below average, average, and above average. Things to consider: amount of subcontracting, mobilization payment item, Government furnished property, equipment and facilities, and expediting assistance.

(6) Assistance by Government. To be weighted from .12 to .03 on the basis of average to above average. Things to consider: use of Government-owned property, equipment and facilities, and expediting assistance.

(7) Subcontracting. To be weighted inversely proportional to the amount of subcontracting. Where 80 percent or more of the work is to be subcontracted, the weighting is to be .03 and such weighting proportionately increased to .12 where all the work is performed by the Contractor's own forces.

1.31 LABOR CONDITIONS APPLICABLE TO TEMPORARY FACILITIES

It is the position of the Department of Defense that the Davis-Bacon Act, 40 U.S.C. 276a is applicable to temporary facilities such as batch plants, sandpits, rock quarries, and similar operations, located off the immediate site of the construction but set up exclusively to furnish required materials for a construction project on the site of the work. Clause "Payrolls and Basic Records" of the CONTRACT CLAUSES is applicable to such operations.

1.32 DRAWING SCALES

All scales shown on the RFP project drawings are based on a standard drawing size of 28" x 40". If any other size drawings are furnished or plotted, the contractor shall adjust the scales accordingly. The Contractor shall also advise his sub-contractors of the above.

1.33 WAGE RATE APPLICATION

1.33.1 Building Schedule

Applicable to all work required within 5 feet outside the building lines.

1.33.2 Heavy and Highway Schedule

Applicable to all work required beyond 5 feet outside the building.

1.34 (FAR 52.222-23) NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for Minority Participation	Goals for Female Participation
for Each Trade	for Each Trade
*****	*****

13.8

6.9

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs Office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the -

- (1) Name, address, and telephone number of the subcontractor;
- (2) Employer identification number of the subcontractor;
- (3) Estimated dollar amount of the subcontract;
- (4) Estimated starting and completion dates of the subcontract; and
- (5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is Denver-Boulder SMSA-2080, which Arapahoe county is a part of.

1.35 FEDERAL HOLIDAYS

The following Federal legal holidays are observed by this installation:

New Year's Day	1 January
Martin Luther King's Birthday	Third Monday in January
President's Day	Third Monday in February
Memorial Day	Last Monday in May
Independence Day	4 July
Labor Day	First Monday in September
Columbus Day	Second Monday in October
Veterans Day	11 November
Thanksgiving Day	Fourth Thursday in November
Christmas Day	25 December

If a wage determination applies the number of holidays specified on it, it has priority over this clause.

1.36 BASE HOURS

Base operation hours are 6:00 a.m. to 6:00 p.m. daily (Monday through

Friday), excluding federal holidays. Access to the base during other times must be requested in writing from the Contracting Officer and will be granted only for extenuating circumstances.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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A B C D E F G H I
J K L M N O P Q R
S T U V W X Y Z
a b c d e f g h i j k l m
n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 10

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m
n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 10

Note: Above lettering styles are Helios Extra Bold Condensed and Helios Bold II.
Helvetica Black Roman and Helvetica Bold Roman are acceptable substitutes.

STANDARD
ALPHABET & NUMERALS
OFFICE OF THE DISTRICT ENGINEER
OMAHA, NEBRASKA
REV. NOVEMBER, 1982

NOTES:

1. Posts to be S4S.
2. Plywood shall be exterior type. A-C grade.
3. Before painting, surface to be clean, dry, free from grease and sanded.
4. Paint with one exterior oil prime coat and exterior type alkyd, conforming to Master Painters Institute MPI-9, MPI Gloss level 6. Color shall match Sherwin Williams SW 2175.
5. All lettering to be exterior type alkyd.
6. Color shall match Sherwin Williams SW 1900.
7. Decalcomania for Corps of Engineers Insignia and U.S. Air Force Emblem will be furnished by the Contracting Officer for installation by the Contractor.
8. All exposed wood (posts, supports, back, etc.) shall be painted the same background color as the sign.



U.S. AIR FORCE

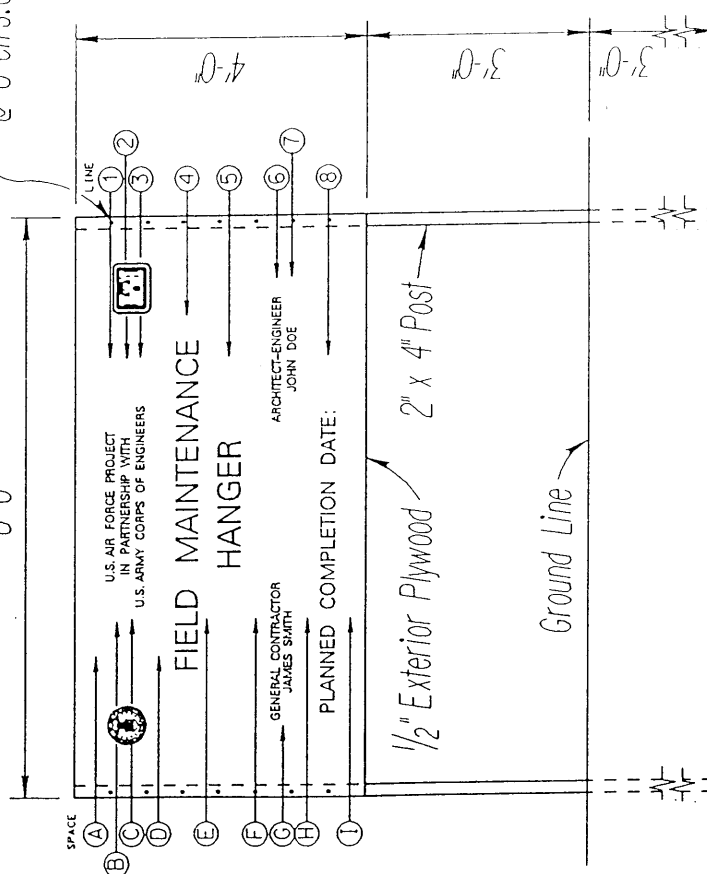
AIR FORCE EMBLEM
(NOT TO SCALE)

SCHEDULE

SPACE	HEIGHT	LINE	DESCRIPTION	LETTER	HEIGHT	STROKE
A	5"	1	U.S. AIR FORCE PROJECT		1.5"	3/16"
B	1"	2	IN PARTNERSHIP WITH		1.5"	3/16"
C	1"	3	U.S. ARMY CORPS OF ENGINEERS		1.5"	3/16"
D	5"	4	PROJECT NAME		4"	1/2"
E	3"	5	PROJECT NAME CONT'D (IF REQ.)		4"	1/2"
F	5"	6	GENERAL CONTRACTOR/A-E		1.5"	3/16"
G	1"	7	GENERAL CONTRACTOR/A-E		1.5"	3/16"
H	4"	8	PLANNED COMPLETION DATE		2.5"	1/4"
I	5"					

*Nail with 8d galv. nails
@ 6" ctrs. each post*

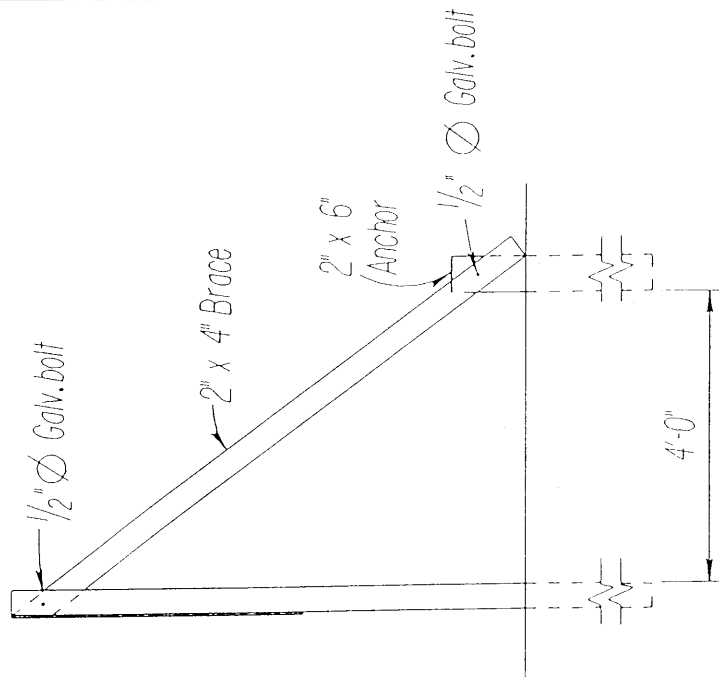
8'-0"



STANDARD

PROJECT SIGN
U.S. AIR FORCE MCP PROJECTS

OFFICE OF THE DISTRICT ENGINEER
OMAHA, NE
REV. OCTOBER 1993



FRONT VIEW

END VIEW

GENERAL DECISION CO010001 11/09/01 CO1
General Decision Number CO010001

Superseded General Decision No. CO000001

State: Colorado

Construction Type:
HEAVY
HIGHWAY

County(ies):
STATEWIDE

HEAVY AND HIGHWAY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	03/02/2001
1	03/09/2001
2	05/04/2001
3	07/06/2001
4	07/20/2001
5	08/10/2001
6	10/05/2001
7	10/12/2001
8	10/19/2001
9	10/26/2001
10	11/09/2001

COUNTY(ies):
STATEWIDE

CARP0002E	05/01/2001		
		Rates	Fringes
CARPENTERS		19.77	5.40

CARP2834A	05/01/2001		
		Rates	Fringes
MILLWRIGHTS		22.22	5.84

ELEC0012B	06/01/2000		
		Rates	Fringes
ALAMOSA, ARCHULETA, BACA, BENT, CHAFFEE, CONEJOS, COSTILLA, CROWLEY,CUSTER, FREMONT, HUERFANO, KIOWA, LAS ANIMAS, MINERAL, OTERO,PROWERS, PUEBLO, RIO GRANDE AND SAGUACHE COUNTIES			
ELECTRICIANS:			
Electrical work \$200,000 or less		18.98	3%+6.14
Electrical work over \$200,000		22.13	3%+6.14

ELEC0068A	06/01/2001		
		Rates	Fringes
ADAMS, ARAPAHOE, BOULDER, CLEAR CREEK, DENVER, DOUGLAS, EAGLE, GILPIN, GRAND, JACKSON, JEFFERSON, LAKE, LARIMER, LOGAN, MORGAN, PHILLIPS, SEDGWICK, SUMMIT, WASHINGTON, WELD AND YUMA COUNTIES			
ELECTRICIANS		25.76	3%+7.21

ELEC0111A	09/01/2001		
		Rates	Fringes
LINE CONSTRUCTION:			
Cable Splicers		26.06	19.75%+2.20
Lineman, Gas Fitter/Welder		26.56	19.75%+2.20
Line Equipment Operator,			
Line Truck Crew		20.73	19.75%+2.20
Groundman		13.64	19.75%+2.20

ELEC0111B	03/01/1998		
		Rates	Fringes
TRAFFIC SIGNAL INSTALLER		18.56	10.6%+ 2.00
EQUIPMENT OPERATOR		17.48	10.6%+ 2.00
GROUNDMAN		11.52	10.6%+ 2.00

ELEC0113C	06/01/2001		
		Rates	Fringes
CHEYENNE, ELBERT, EL PASO, KIT CARSON, LINCOLN, PARK, AND TELLER COUNTIES			
ELECTRICIANS		23.35	3%+8.14

ELEC0969C 06/01/2000

	Rates	Fringes
DELTA, DOLORES, GARFIELD, GUNNISON, HINSDALE, LA PLATA, MESA, MOFFAT, MONTEZUMA, MONTROSE, OURAY, PITKIN, RIO BLANCO, ROUTT, SAN JUAN AND SAN MIGUEL COUNTIES		

ELECTRICIANS	20.35	4%+5.14
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ENGI0009A 04/23/2001

	Rates	Fringes
POWER EQUIPMENT OPERATORS: (TUNNELS ABOVE AND BELOW GROUND, SHAFTS, AND RAISES)		
GROUP 1	20.67	5.17
GROUP 2	21.02	5.17
GROUP 3	21.12	5.17
GROUP 4	21.37	5.17
GROUP 5	21.52	5.17
GROUP 6	21.92	5.17
GROUP 7	21.67	5.17

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1 - Brakeman

GROUP 2 - Motorman

GROUP 3 - Compressor

GROUP 4 - Air Tractors; Grout Machine; Gunnite Machine; Jumbo
Form

GROUP 5 - Concrete Placement Pumps; Mucking Machines and Front
End Loaders, Underground, Slusher; Mine Hoist Operator; Mechanic

GROUP 6 - Mole

GROUP 7 - Mechanic Welder

ENGI0009B 04/23/2001

	Rates	Fringes
POWER EQUIPMENT OPERATORS:		
GROUP 1	18.52	5.17
GROUP 2	18.87	5.17
GROUP 3	19.22	5.17
GROUP 4	19.37	5.17
GROUP 5	19.52	5.17
GROUP 6	19.67	5.17
GROUP 7	20.43	5.17

NOTE: Any equipment listed below being used in tunnel work, below

or above ground shall be paid not less than \$2.00 per hour above the listed wage rates.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1 - Air compressor, oiler, brakeman, drill operator - smaller than Williams MF and similar, tender to heavy duty mechanic and/or welder, operators of 5 or more light plants, welding machines, generators, single unit conveyor, pumps, vacuum well point system, tractor, under 70 hp with or without attachments compressors, 360 C.F.M. or less

GROUP 2 - Conveyor, handling building materials, ditch witch and similar trenching machine, fireman or tank heater, road, forklift, haulage motor man, pugmill, portable screening plant with or without a spray bar, screening plants, with classifier, self-propelled roller, rubber-tires under 5 tons, grade checker

GROUP 3 - Asphalt screed, asphalt plant, backfiller, bituminous spreader or laydown machine; cableway signalman, caisson drill, William MF, similar or larger; C.M.I. and similar, concrete batching plants, concrete finish machine, concrete gang saw on concrete paving, concrete mixer, less than 1 yd., concrete placement pumps, under 8 inches, distributors, bituminous surfaces, drill, diamond or core, drill rigs, rotary, churn, or cable tool, elevating graders, equipment, lubricating and service engineer, engineer fireman, grout machine, gunnite machine, hoist, 1 drum, hydraulic backhoes, wheel mounted under 3/4 yd., loader, barber green, etc.; loader up to and including 6 cubic yards, motor grader/blade, rough; road stabilization machine, rollers, self-propelled all types over 5 tons, sandblasting machine, single unit portable crusher, with or without washer, tie tamper, wheel mounted, tractor, 70 hp and over with or without attachments, trenching machine operator, winch on truck

GROUP 4 - Cable operated crane, track mounted, cable operated power shovels, draglines, clamshells, and backhoes, 5 cubic yards and under, concrete mixer over 1 cubic yard, concrete paver 34E or similar, concrete placement pumps, 8 inches and over, crane, 50 tons and under, hoist, 2 drums, hydraulic backhoe, 3/4 yds and over, loader, over 6 cubic yards, machine doctor, mechanic, mixer mobile, motor grader/blade, finish, multiple unit portable crusher, with or without washer; piledriver, scrapers, single bowl under 40 cubic yards, self-propelled hydraulic crane, tractor with sideboom, truck mounted hydraulic crane, roto-mill and similar, welder

GROUP 5 - Cable operated power shovels, draglines, clamshells and backhoes over 5 cubic yards, crane 51 to 90 tons carrier mounted, electric rail type tower crane, hoist, 3 drum or more, quad nine and similar push unit, scrapers single bowl including pups 40

cubic yards and tandem bowls and over mechanic - welder (heavy-duty)

GROUP 6 - Cableway, crane (91 to 140 tons), climbing tower crane,

crawler or truck mounted tower crane, derrick, wheel excavator,
tower crane, rail type, belt or elevating loader

GROUP 7 - Cranes (140 tons and over)

IRON0024F 08/01/2001		
	Rates	Fringes
IRONWORKERS:		
STRUCTURAL, ORNAMENTAL, AND		
REINFORCING	21.00	7.36

* LABO0086A 05/01/2001		
	Rates	Fringes
LABORERS:		
GROUP 1	11.75	3.64
GROUP 2	15.10	3.64
GROUP 3	15.60	3.64

LABORER CLASSIFICATIONS

GROUP 1 - Janitors; Yardmen

GROUP 2 - Minimum labor, Traffic Control Director(certified);
including caissons to 8' carrying Reinforcing Rods; Dowel Bars;
Fence Erectors; Fire Watchers on power plants and oil
refineries; Gabion Basket and Reno mattresses; Signaling, Metal
Mesh; Nursery Man (including seeding; mulching and planting
trees); pipe plants and yards; Shrubs and flowers; Stake Caser;
Traffic Control Devices; Tie Bars and Chairs in Concrete;
Paving; Waterproofing Concrete; Air, Gas, Hydraulic Tools and
Electrical Tool Operators; Barco Hammers; Cutting Torches;
drill; diamond and core drills; Core, diamond, air track
including but not limited to; Joy, Mustang, PR-143, 220
Gardner-Denver, Hydrosonic, and water blaster operator; Chuck
Tender; Electric hammers; Jackhammers; Hydraulic Jacks; Tampers;
Air Tampers; Boring Machines; Air Hydraulic Boring machines;
Automatic Concrete Power Curbing Machines; Concrete
Processing Material; form setters; Highways, Streets, and
Airports runways; Operators of concrete saws on pavement (other
than gangsaws); Power operated Concrete Buggies; Hot Asphalt
Labor; Asphalt Curb Machines; Paving Breakers; Transverse
Concrete Conveyor Operator; Cofferdams; Boxtenders; Caisson 8'
to 12'; Caisson Over 12'; Jackhammer Operators in Caissons over
12'; Labor applicable to Pipe coating or Wrapping; Pipe
Wrappers, Plant and Yard; Relining Pipe; Hydroliner (a plastic
may be used to waterproof); Pipelayer on Underground Bores;
Sewer, Water, Gas, Oil and Telephone Conduit; Enamalers on Pipe,
inside and out, Mechanical Grouters; Monitors; Jeep Holiday
Detector Men; Pump Operators; Rakers; Vibrators; Hydro- broom,

Mixer Man; Gunnite Nozzelmen; Shotcrete Operator; and chain
saws, gas and electric; Sand Blaster; Licensed Powdermen;
Powdermen and Blaster; Siphons; Signalmen; Dumpman/spotter;
Grade Checker.

GROUP 3 - Plug and galleys in dams; Scalers; any work on or off
Bridges 40' above the ground performed by Laborers working from
a Bos'n Chair, Swing Stage, Life Belt, or Block and Tackle as
a safety requirement

* LABO0086B 05/01/2001

	Rates	Fringes
LABORERS: (TUNNEL)		
GROUP 1	15.05	3.64
GROUP 2	15.95	3.64
GROUP 3	16.05	3.64
GROUP 4	17.15	3.64
GROUP 5	17.10	3.64

TUNNEL LABORER CLASSIFICATIONS

GROUP 1 - Outside Laborer - Above ground

GROUP 2 - Minimum Tunnel Laborer, Dry Houseman

GROUP 3 - Cable or Hose Tenders, Chuck Tenders, Concrete
Laborers, Dumpmen, Whirley Pump Operators

GROUP 4 - Tenders on Shotcrete, Gunniting and Sand Blasting;
Tenders, core and Diamond Drills; Pot Tenders

GROUP 5 - Collapsible Form Movers and Setters; Miners; Machine
Men and Bit Grinders; Nippers; Powdermen and Blasters;
Reinforcing Steel Setters; Timbermen (steel or wood tunnel
support, including the placement of sheeting when required); and
all Cutting and Welding that is incidental to the Miner's work;
Tunnel Liner Plate Setters; Vibrator Men, Internal and External;
Unloading, stopping and starting of Moran Agitator Cars; Diamond
and Core Drill Operators; Shotcrete operator; Gunnite Nozzlemen;
Sand Blaster; Pump Concrete Placement Men.

* LABO0086C 05/01/2001

	Rates	Fringes
LABORERS: (SHAFTS, RAISES, MISSILE SILOS AND ALL UNDERGROUND WORK OTHER THAN TUNNELS)		
GROUP 1	16.05	3.64
GROUP 2	16.20	3.64
GROUP 3	16.30	3.64
GROUP 4	16.55	3.64
GROUP 5	16.65	3.64
GROUP 6	17.25	3.64

LABORER CLASSIFICATIONS (SHAFTS, RAISES, MISSILE SILOS AND
UNDERGROUND)

GROUP 1 - Laborers; Topmen; Bottommen; Cagers

GROUP 2 - Chucktenders; Concrete Laborers; Whirley Pump Operators

GROUP 3 - Tenders in Shotcrete Gunniting and Sandlasting;
Tenders on Core and Diamond Drills; Pot Tenders

GROUP 4 - Diamond and Core Drill Operators; Gunnite Nozzlemen;
Shotcrete Operators; Sandblasters; and Pump Concrete Placement
Men

GROUP 5 - Any employee performing work underground from a bos'n
chair, swinging stage, life belt or block and tackle as a safety
requirement

GROUP 6 - Collapsible Form Movers and Setters, Miners, Machine
Men and Bit Grinders; Nippers; Powdermen and Blasters;
Reinforcing Steel Setters; Timbermen (steel or wood tunnel
support, Including the Placement of Sheeting when Required) and
all Cutting and Welding that is Incidental to the Miner's Work;
Liner Plate Setters; Internal and External Vibrator Men;

* LABO0086D 05/01/2001

	Rates	Fringes
LABORERS:		
Removal or encapsulation of Asbestos Material (including removal of asbestos from mechanical systems that are going to be scraped) and work involving the removal, handling, or dealing with toxic or hazardous waste	18.45	3.64

WATER, SEWAGE AND GAS LINES

	Rates	Fringes
Janitors, Yardmen	11.75	3.64
Laborers, Traffic Control		
Director	14.35	3.64
Pipelayer (one per crew)	14.85	3.64

PAIN0079G 08/01/2001

	Rates	Fringes
PAINTERS:		
BRUSH	19.41	4.02
SPRAY AND SWING STAGE	20.41	4.02

PLAS0577D 05/01/2000

	Rates	Fringes
CEMENT MASONS	20.20	3.52
HAZARDOUS AND TOXIC WASTE CONSTRUCTION SPECIALIST:	22.20	3.52
CONCRETE SPECIALIST: Including finishing; grouting patching and curbing	23.20	3.52

PLUM0003E 07/01/2001

	Rates	Fringes
DENVER COUNTY		
PLUMBERS	25.67	5.99

PLUM0020E 07/01/2001

	Rates	Fringes
ALAMOSA, BACA, BENT, CHAFFEE, COSTILLA, CROWLEY, CUSTER, FREMONT, HUERFANO, KIOWA, LAS ANIMAS, MINERAL, OTERO, PROWERS, PUEBLO, RIO GRANDE & SAGUACHE		

PLUMBERS & PIPEFITTERS (Including HVAC Work):

Free Zone - 0 - to 40 miles	19.85	6.17
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Zone 1 - 40 miles and over: \$19.85 per hour + \$32.00 per day per diem will be paid on projects over 40 miles (Zone 1) measured in practical driving miles by the shortest route, beginning at 5th and Main Streets in Pueblo, Colorado, when the employee stays overnight or drives their own vehicle.

Hazardous Pay: Add \$2.20 per hour to \$19.85 base rate.
Hazardous pay applies to projects at chemical plants, steel mills, cement plants, power generator plants, process piping at manufacturing plants, food processing plants, and all projects which may present a health hazard or serious personal injury.

PLUM0058E 07/01/2001

	Rates	Fringes
CHEYENNE, EL PASO, AND TELLER, ELBERT (SOUTHERN PORTION INCLUDING THE TOWNS OF ELBERT, MATHERSON AND SIMLA), LINCOLN (INCLUDING THE TOWN OF GEONA AND ARRIBA IN THE SOUTHERN PORTION OF COUNTY), KIT CARSON (INCLUDING TOWNS OF DFALGLER, SEIBERT, VONA, STRATTON AND BETHUNE), DOUGLAS (INCLUDING TOWNS OF LASPUR AND PALMER LAKE), PARK (INCLUDING TOWNS OF FAUPLAY, HARTSEL, AND LAKE GEORGE) COUNTIES		

PLUMBERS & PIPEFITTERS:	24.30	6.40
-------------------------	-------	------

PLUM0145B 05/01/2001

	Rates	Fringes
MONTEZUMA COUNTY		
PLUMBERS	21.78	5.50

PLUM0208J 07/01/2001

	Rates	Fringes
DENVER COUNTY:		
PIPEFITTERS	25.77	5.89

TEAM0435A 05/01/2000

	Rates	Fringes
TRUCK DRIVERS:		
GROUP 1	14.21	5.27
GROUP 2	14.93	5.27
GROUP 3	15.27	5.27
GROUP 4	15.80	5.27
GROUP 5	16.45	5.27
GROUP 6	17.25	5.27

TRUCK DRIVER CLASSIFICATIONS

GROUP 1 Pickup, Greasemen, Servicemen and Ambulance Drivers, Battery Men, Sweeper Truck, Flat Rack Single Axle and Manhaul, Shuttle Truck or Bus, Flat Rack Tandem Axle.

GROUP 2 Dump Truck Driver to and including 6 cubic yards, Dump Truck Driver over 6 cubic yards to and including 14 cubic yards, Fork Lift Driver, Straddle Truck Driver, Lumber Carrier, Liquid and Bulk Tankers Single Axle, Tandem Axle, Semi or Combination, Euclid Electric or Similar, Multipurpose Truck Specialty and Hoisting, Truck Drivers Fuel Truck, Grease Truck, Combination Fuel and Grease.

GROUP 3 Truck Driver Snow Plow, Truck Driver Dumptor Type Jumbo and similar type equipment, Dump Truck Driver of 14 cubic yards to and including 29 cubic yards, Floats.

GROUP 4 Dump Truck Driver over 29 cubic yards to and including 79 cubic yards, Cement Mixer Agitator Truck over 10 cubic yards to and including 15 cubic yards, Tire Man, Distributor Truck Driver, Cab Operated Distributor Truck Driver.

GROUP 5 Dump Truck Driver over 79 cubic yards, Mechanic, Heavy Duty Diesel Mechanic, Body Man, Welders or Combination Men.

GROUP 6 Low Boy.

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

=====

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(v)).

In the listing above, the "SU" designation means that rates listed under that identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor

200 Constitution Avenue, N. W.
Washington, D. C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

4.) All decisions by the Administrative Review Board are final.
END OF GENERAL DECISION

GENERAL DECISION CO010008 11/09/01 CO8
General Decision Number CO010008

Superseded General Decision No. CO000008

State: Colorado

Construction Type:
BUILDING

County(ies):
ARAPAHOE

BUILDING CONSTRUCTION PROJECTS (does not include residential
construction consisting of single family homes and apartments up
to and including 4 stories)

Modification Number	Publication Date
0	03/02/2001
1	03/09/2001
2	04/20/2001
3	05/04/2001
4	07/06/2001
5	07/20/2001
6	08/10/2001
7	10/12/2001
8	11/09/2001

COUNTY(ies):
ARAPAHOE

ASBE0028A 01/01/2001	Rates	Fringes
ASBESTOS WORKERS/INSULATORS (Includes application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems and asbestos removal)	17.12	4.85

BRC00007A 05/01/2001	Rates	Fringes
TILE SETTERS	22.42	5.66

CARP2834A 05/01/2001	Rates	Fringes
MILLWRIGHTS	22.22	5.84

CARP9901E 05/01/2001	Rates	Fringes
CARPENTERS (Including Drywall Hanging, Excluding Acoustical Ceiling and Batt Insulation)	19.80	5.50

ELEC0068G 06/01/2001	Rates	Fringes
ELECTRICIANS (Including Low Voltage, Fire Alarm and Fiberoptic Work)	25.76	3%+7.21

ENGI0009L 05/01/2000	Rates	Fringes
POWER EQUIPMENT OPERATORS:		
Backhoe, 3/4 yd.	19.22	5.17
Backhoe, 3/4 yd. and over	19.37	5.17
Cranes:		
141 tons and over	20.43	5.17
91 to 140 tons	19.67	5.17
51 to 90 tons	19.52	5.17
50 tons and under	19.37	5.17
Crane Oiler	18.52	5.17
Grade Checker	18.87	5.17
Front End Loader		
Over 6 cubic yards	19.37	5.17
up to and including 6 cy	19.22	5.17
Belt or Elevating	19.67	5.17
Heavy Duty Drills		
Caisson, CMI, Diamond or		

Core, Rotary, Churn or Cable Tool	19.22	5.17
Mechanic/Equipment Welder	19.52	5.17
Oiler, Assistant to Engineer	18.52	5.17

IRON0024E 08/01/2001		
	Rates	Fringes
IRONWORKERS, Reinforcing and Structural	21.00	5.35

* LABO0720B 05/01/2001		
	Rates	Fringes
LABORERS, Unskilled	12.95	3.86

PAIN0079N 08/01/2001		
	Rates	Fringes
PAINTERS		
Brush and Roller	16.41	4.02
Spray	17.41	4.02
Paperhanger	17.11	4.02

PAIN0930A 07/01/2000		
	Rates	Fringes
GLAZIERS	23.64	4.40

PLUM0003A 07/01/2001		
	Rates	Fringes
PLUMBERS	25.67	5.99

PLUM0208A 07/01/2001		
	Rates	Fringes
PIPEFITTERS (Including HVAC Work)	25.77	5.89

* ROOF0041A 06/01/2001		
	Rates	Fringes
ROOFERS	15.00	2.48

SFCO0669A 04/01/2001		
	Rates	Fringes
SPRINKLER FITTERS	26.51	7.50

* SHEE0009B 07/01/2001		
	Rates	Fringes
SHEET METAL WORKERS (Includes HVAC Ductwork and Architectural/ Roofing)	25.34	8.35

SUCO1025A 03/04/1994

	Rates	Fringes
CAULKERS	13.90	2.00
CEMENT MASONS	14.00	
DRYWALL FINISHERS	13.49	
LATHERS	14.00	
PLASTERERS	14.25	
PLASTERERS TENDERS	12.00	
POWER EQUIPMENT OPERATORS:		
Tractor Rubber-Tire	13.58	3.02

TEAM0435D 05/01/2000

	Rates	Fringes
TRUCK DRIVERS:		
Tandem	14.93	5.27

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

=====

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Washington, D. C. 20210

4.) All decisions by the Administrative Review Board are final.
END OF GENERAL DECISION

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CONTRACTOR'S EMPLOYEE'S VERIFICATION LIST
THIS FORM IS SUBJECT TO THE PRIVACY ACT OF 1974

CONTRACTOR'S NAME _____
 ADDRESS & PHONE _____
 DATE _____ POINT OF CONTACT _____
 SITE LOCATION _____

PLEASE LIST NAMES AND COMPANIES IN ALPHABETICAL ORDER

LAST	NAME FIRST	MI	COMPANY NAME	CONTRACT EXPIRATION	SSAN	DATE OF BIRTH

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BASE CIVIL ENGINEERING WORK CLEARANCE REQUEST <i>(See Instructions on Reverse)</i>										DATE PREPARED	
1. Clearance is requested to proceed with work at _____ on Work Order No. _____, Contract No. _____, involving excavation or utility disturbance per attached sketch. This area <input type="checkbox"/> has <input type="checkbox"/> has not been staked or clearly marked.											
2. TYPE OF FACILITY/WORK INVOLVED											
<input type="checkbox"/> A. PAVEMENTS		<input type="checkbox"/> D. FIRE DETECTION & PROTECTION SYSTEMS		<input type="checkbox"/> G. AIRCRAFT OR VEHICULAR TRAFFIC FLOW		<input type="checkbox"/> H. SECURITY		<input type="checkbox"/> I. OTHER			
<input type="checkbox"/> B. DRAINAGE SYSTEMS		<input type="checkbox"/> E. UTILITY		<input type="checkbox"/> OVERHEAD		<input type="checkbox"/> UNDERGROUND					
<input type="checkbox"/> C. RAILROAD TRACKS		<input type="checkbox"/> F. COMM		<input type="checkbox"/> OVERHEAD		<input type="checkbox"/> UNDERGROUND					
3. DATE CLEARANCE REQUIRED						4. DATE OF CLEARANCE					
5. SIGNATURE OF REQUESTING OFFICIAL						6. TELEPHONE NO.			7. ORGANIZATION		
ORGANIZATION				REMARKS <i>(Use Reverse for additional comments)</i>				REVIEWER'S NAME AND INITIALS			
8. B A S E C I V I L E N G I N E E R I N G	A. ELECTRICAL DISTRIBUTION										
	B. STEAM DISTRIBUTION										
	C. WATER DISTRIBUTION										
	D. POL DISTRIBUTION										
	E. SEWER DISTRIBUTION										
	F. ENVIRONMENTAL										
	G. PAVEMENTS/ GROUNDS										
	H. FIRE PROTECTION										
	I. ZONE _____										
	J. OTHER <i>(Specify)</i>										
9. SECURITY POLICE											
10. SAFETY											
11. COMMUNICATIONS											
12. BASE OPERATIONS											
13. CABLE TV											
14. COMMERCIAL UTILITY COMPANY											
<input type="checkbox"/> TELEPHONE											
<input type="checkbox"/> GAS											
<input type="checkbox"/> ELECTRIC											
15. OTHER <i>(Specify)</i> _____											
16. REQUESTED CLEARANCE <input type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED											
17. TYPED NAME AND SIGNATURE OF APPROVING OFFICER <i>(Chief of Operations Flight or Chief of Engineering Flight)</i>										17a. DATE SIGNED	

INSTRUCTIONS

The BCE work clearance request is used for any work (contract or in-house) that may disrupt aircraft or vehicular traffic flow, base utility services, protection provided by fire and intrusion alarm system, or routine activities of the installation. This form is used to coordinate the required work with key base activities and keep customer inconvenience to a minimum. It is also used to identify potentially hazardous work conditions in an attempt to prevent accidents. The work clearance request is processed just prior to the start of work. If delays are encountered and the conditions at the job site change (or may have changed) this work clearance request must be reprocessed.

18. REMARKS. *(This section must describe specific precautionary measure to be taken before and during work accomplishment. Specific comments concerning the approved method of excavation, hand or powered equipment, should be included.)*

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01001

SUMMARY OF WORK

PART 1 SUMMARY OF WORK

- 1.1 FUNCTION
 - 1.1.1 Physical Fitness Center
- 1.2 GOALS AND OBJECTIVES
 - 1.2.1 Codes
 - 1.2.2 Building Durability
 - 1.2.3 Alternate Construction Methods
 - 1.2.4 Sustainable Design Technology
 - 1.2.5 Reference Documents
- 1.3 BUILDING SIZE
- 1.4 DRAWINGS
- 1.5 OPERATION AND MAINTENANCE REQUIREMENTS/TRAINING
 - 1.5.1 Operation and Maintenance Manuals
 - 1.5.2 Training
- 1.6 OVERVIEW OF DESIGN-BUILD PROCESS
 - 1.6.1 Overview
 - 1.6.2 Process
- 1.7 DESIGN-BUILD CONTRACTOR REQUIRED A/E SERVICES
 - 1.7.1 Dimensions
 - 1.7.2 Professional Licenses
 - 1.7.3 Request For Proposal - Binding Information
 - 1.7.4 Evaluation of Systems
 - 1.7.5 Document Requirements
 - 1.7.5.1 Design documents at all stages of design include:
 - 1.7.5.2 Drawing Requirements
 - 1.7.5.3 60 Percent Design Requirements
 - 1.7.5.4 100 Percent Design Requirements
 - 1.7.5.5 100 Percent Corrected Final Design
- 1.8 SEQUENCE OF DESIGN-CONSTRUCTION

PART 2 NOT USED

PART 3 NOT USED

-- End of Section Table of Contents --

SECTION 01001

SUMMARY OF WORK

PART 1 SUMMARY OF WORK

1.1 FUNCTION

1.1.1 Physical Fitness Center

The new Physical Fitness Center located at Buckley Air Force Base, Colorado will provide a quality facility to enhance both the mission effectiveness and the quality of life at this remote base.

This Facility is being designed to allow for adequate comprehensive programs for military personnel, their dependents, retired military personnel, and distinguished visitors. The anticipated average daily attendance for this facility is 200 people. The facility will provide adequate support for athletics, aerobic activities, auxiliary administrative support, parking, and support areas.

Included with the construction of this facility are an 76-stall parking lot, an asphalt connector drive and service drive, an additional parking area with 5 stalls, sidewalks, landscaping, seeding and sodding, lawn and plant irrigation, and utilities. A 117-stall parking lot with access drive may be constructed as an option item to the basic bid price. Increased quantities and areas of landscape plantings, sod and irrigation are a landscaping option to the basic contract price. An additional plant bed shall be provided if the Health and Wellness Center Option is exercised. Walks and drives shall be expanded or modified to facilitate any building options that are being exercised.

This facility will be located west of the main gate. The facility will be orientated towards Steamboat Avenue, between Telluride (formerly Powderhorn) Avenue and Eldora Street. An Administrative Facility exists on the east side of the site, and a gas station is being constructed on the northwest side of the site. Ballfields and a dining facility are planned for the area in the future.

This facility will consist of a main Gymnasium with an elevated running track along the perimeter, Office space with control area, juice bar, lap pool with two spas, Health and Wellness center, exercise rooms, Cardiovascular room, racquetball courts, Men's and Women's toilet and locker facilities, Weight room located within the existing Aerobics facility, Laundry area, storage areas, communications area, and Mechanical / Electrical spaces.

1.2 GOALS AND OBJECTIVES

Based on user interviews during the predesign conference and design charrette the following goals were defined:

1.2.1 Codes

Building codes and life safety codes shall be met or exceeded. All applicable codes are listed in each section.

1.2.2 Building Durability

Materials and equipment will be chosen for their durability with minimum or nonexistent maintenance. The building design will conserve manmade resources and energy usage.

1.2.3 Alternate Construction Methods

Alternate methods and materials, which represent value-for-the-money, will be considered for all aspects of the project, except where prohibited by the RFP. The intent of this design-build proposal is to present an overall design concept with some definition of the systems to be used. It shall be the responsibility of the design-build contractor to assemble the best value-priced construction systems for this project that meet or exceed the design criteria set forth herein.

1.2.4 Sustainable Design Technology

To the extent referenced in the solicitation, the Contractor shall provide a facility which utilizes sustainable design principles. The basic objectives are to:

- 1) Reduce consumption of energy, land and other non-renewable resources.
- 2) Minimize waste of materials, water, and other limited resources.
- 3) Consider the cost of energy dollars while creating livable, healthy and productive environments that maintain comfort, health, and safety for the people using the facility.

Green Building Technology and Whole Building Design are referenced names involving sustainable design principles.

Related References:

ETL 1110-3-491 (31 January 2000) Sustainable Design for Military Facilities

Web Sites to Consider for Sustainable Design:

EPA Designated product (available at <http://www.epa.gov/cpg>)

Green Building Council: <http://www.usgbc.org>

Whole Building Design Guide: <http://www.wbdg.org/>

Energy Star Building Program - Environmental Protection Agency:
<http://www.epa.gov/energystar/>

Leadership in Energy and Environmental Design Green Building Rating System Criteria (LEED) U.S. Green Building Council:
<http://www.usgbc.org/programs.lead.htm>

U. S. Department of Energy website:

www.eren.doe.gov/buildings/build_design.html

Air Force Space Command:

USAF Environmentally Responsible Facility Guide

(<http://www.afcee.brooks.af.mil/green/facilitiesguide/erfguide.pdf>)

1.2.5 Reference Documents

There may be references (outside design resource documents) included in this RFP that are not specifically referred to in the criteria requirements (i.e. List of References). Such references (i.e. U.S.A.F. Physical Fitness Design Guide) are intended only as support documents for design to the designer, unless referred to specifically in the criteria sections. These references are not intended to add additional scope to the project. If conflicts arise between this request for proposal and these references, the requirements stated in this RFP shall govern.

1.3 BUILDING SIZE

The Physical Fitness Center has a target-size of 67,900 square foot facility including the existing Aerobics facility.

1.4 DRAWINGS

Functional concept drawings of the site area and floor plans are included for use in developing this design.

1.5 OPERATION AND MAINTENANCE REQUIREMENTS/TRAINING

1.5.1 Operation and Maintenance Manuals

The intent of the O&M Manuals are to promote and maximize the efficiency, economy, safety, and effectiveness of the life cycle operation, maintenance, and repair of the facility. Operation and maintenance manuals as required by the Technical Specifications (Divisions 1 thru 16) shall be provided.

1.5.2 Training

The Contractor shall provide operational and maintenance training for all systems furnished under this contract. The training will be for the operating and maintenance personnel. The training shall be put on by the system manufacturer. The training shall not take place until the operation and maintenance manuals are submitted and approved. The Contractor shall video tape the training session on VHS tapes and provide tapes to the Government.

1.6 OVERVIEW OF DESIGN-BUILD PROCESS

1.6.1 Overview

Since the early 1980s Congress has urged the military services to explore alternative construction methods, such as "Design-Build," which includes both design and construction under a single contract. This process is similar to "one-step turnkey selection procedures" and is defined in Title 10 of the United States Codes, Section 2862.

1.6.2 Process

The design-build process uses a Request for Proposal (RFP) to solicit for design and construction of a facility by a single contractual entity, such as a design-build firm, or joint venture between architect-engineer (A-E) and construction firm, or a construction management (CM) firm joint venture with an A-E and a construction firm. A design-build RFP states the project functional requirements, design and engineering criteria, technical performance specifications, and proposal evaluation factors. Potential contractors develop their proposals for the government to evaluate competitively, with the contract award based on a combination of technical merit and price.

In general, the RFP is a conceptual design document and the design-build contractor is responsible for completing the design and constructing the project. The RFP has developed the site plan and building design and given the facility an architectural character. These designs, with minor deviations allowed for detailing and constructibility, must be carried through to construction. The design-build contractor is responsible for all other designs on the project, such as the HVAC system, as long as they fit within the established criteria, and can be built on time and within budget.

After award of the contract, the design-build contractor will prepare a series of design submittals for review by the Government, so that design and criteria compliance can be effectively monitored for compliance. After approval of the final design, construction can begin. On-site construction activities shall not begin until all final corrected plans, specifications and design analysis for the entire project (as defined in Section 00800) have been accepted by the Government (for purposes of beginning construction), and construction documents are received).

1.7 DESIGN-BUILD CONTRACTOR REQUIRED A/E SERVICES

The following is a condensed summary of Section 01332, "SUBMITTALS DURING DESIGN" contained elsewhere in this document. Refer to this Section for the full requirements.

1.7.1 Dimensions

Design, products and construction for the Physical Fitness Center project shall be accomplished using english expressions of measurement. All measurements in the technical performance specifications sections are shown in english.

1.7.2 Professional Licenses

The award of contract will be made to one qualified contractual entity who will be responsible for design completion and the entire construction process for the facility. This contractual entity shall employ qualified building design professionals with appropriate state licenses.

1.7.3 Request For Proposal - Binding Information

The information contained in this Request for Proposal (RFP) shall be considered binding unless specifically waived by the Contracting Officer. The successful offerer's proposal, along with any clarifications and/or best and final offers are a binding part of this contract. Site design, building design, architectural character and engineering/performance criteria shall be implemented through construction by the design-build contractor.

1.7.4 Evaluation of Systems

As part of the basic services, the design-build contractor shall evaluate building systems and components for their possible inclusion into the design. If these systems and components meet the specified design and performance criteria in the RFP, they may then be incorporated into the work.

1.7.5 Document Requirements

For a more detailed list of design and construction submittals, see Section 01332, Submittal During Design.

1.7.5.1 Design documents at all stages of design include:

Construction drawings.

Specifications.

Design analysis narrative with calculations for all disciplines.

Magnetic media at the 100 percent corrected final design only.

1.7.5.2 Drawing Requirements

All design drawings shall be accomplished using english units of measurement. Prepare 28 inches x 40 inches full-size drawings and half-size drawings in accordance with the Omaha District CADD Standards Manual (Available at the following internet address:
<ftp://ftp.nwo.usace.army.mil/pub/ED/CADD/ae/standards/>

file: ACADstd.pdf for AutoCAD.

The design-build contractor shall submit the design at various stages of completion, plus the final documents, for review and comment. These stages are:

60 percent design submittal.

100 percent design submittal.

100 percent corrected final design.

1.7.5.3 60 Percent Design Requirements

Drawings, furniture footprint drawing, specifications, design analysis and calculations for all disciplines at an approximate 60 percent level of completion.

Color boards for SID. NOTE: SID package shall be final at the 60% submittal. The 100% submittal shall be updated as required.

1.7.5.4 100 Percent Design Requirements

Incorporate all comments from the 60 percent review.

Drawings, furniture footprint drawing, specifications, design analysis and calculations for all disciplines at 100 percent level

of completion. All aspects of the project are complete.

Updated Color boards; SID.

1.7.5.5 100 Percent Corrected Final Design

Incorporate comments from the 100 percent design submittal.

Magnetic media.

1.8 SEQUENCE OF DESIGN-CONSTRUCTION

The schedule for design-construction shall meet the requirements as set forth in the provisions of the contract. See Section 00800 SPECIAL CONTRACT REQUIREMENTS for additional requirements.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01002

SITE WORK

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- 1.2 OMAHA DISTRICT CORPS OF ENGINEERS STANDARD DETAILS AND CADD CELLS.
- 1.3 SURVEY
 - 1.3.1 Field Survey.
 - 1.3.2 Other Pertinent Data
- 1.4 STAGING AND CONTRACTORS ACCESS
 - 1.4.1 Staging Area
 - 1.4.2 Contractors Access Route
- 1.5 DEMOLITION AND REMOVAL
- 1.6 NEW CONSTRUCTION
 - 1.6.1 Building
 - 1.6.2 Entrance Walks.
 - 1.6.3 Walks
 - 1.6.4 Parking
 - 1.6.4.1 76-Stall Lot
 - 1.6.4.2 117-Stall Lot
 - 1.6.4.3 General Requirements
 - 1.6.5 Service Walks/Drives
 - 1.6.6 Dumpster Screenwall Enclosure
 - 1.6.7 Bicycle Racks
 - 1.6.8 Landscaping
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PART 2 NOT USED

PART 3 NOT USED

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SECTION 01002

SITE WORK

PART 1 SITE WORK

1.1 REFERENCES

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA M17 (1989) Installation, Field Testing, and
Maintenance of Fire Hydrants

AWWA C651 (1992) Disinfecting Water Mains

Technical Instruction (TI)

TI 814-01 (1998) Water Supply

TI 814-03 (1998) Water Distribution

TI 814-10 (1998) Wastewater Collection

AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM)

ASTM D 977 (1991) Emulsified Asphalt

ASTM D 2027 (1976; R 1992) Cutback Asphalt
(Medium-Curing Type)

ASTM D 2028 (1976; R 1992) Cutback Asphalt
(Rapid-Curing Type)

ASTM D 2397 (1994) Cationic Emulsified Asphalt

HANDICAPPED STANDARDS (HS)

ADAAG (January 1998) Accessibility Guidelines
for Buildings and Facilities

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

NOAA ATLAS 2 (1973) Precipitation-Frequency Atlas of
the Western United States

AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO A Policy on Geometric Design of Highways
and Streets

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI D6.1 (1988) Manual on Uniform Traffic Control
Devices for Streets & Highways

MILITARY HANDBOOKS (MH)

MIL-HDBK-1008C (10 Jun 1997) Fire Protection for
Facilities Engineering, Design, and
Construction

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 24 (1995) Installation of Private Fire
Service Mains and Their Appurtenances

STATE OF COLORADO SPECIFICATIONS

Highway Specifications Colorado Highway Specifications

1.2 OMAHA DISTRICT CORPS OF ENGINEERS STANDARD DETAILS AND CADD CELLS.

The Omaha Districts Civil and Environmental standard details and CADD cells are available on the Omaha District FTP site. See website identified in Section 01332 SUBMITTALS DURING DESIGN. These standards and cells are available for the Contractor's use. References to using exact details and drawings are found in this section. In those cases, the Contractor shall use the referenced standard drawings and/or details.

1.3 SURVEY

1.3.1 Field Survey.

The engineering survey to be used in the development of the design submittal is available to the Contractor on CD-ROM furnished with this solicitation. The information is English units in a 3-d Autocad 2000 drawing file, BU30p0su.dwg. The survey data information was gathered by a topographical survey performed in July of 2001. Contours were gathered at 1-foot intervals.

1.3.2 Other Pertinent Data

Steamboat Avenue, on the south side of the site; Telluride (formerly Powderhorn) Avenue on the west side side of the site; a gas station on the northwest side of the site; a Commissary (BX) west of the site; and additions to Building 26 and a parking lot addition east of the site were all under construction during the performance of the field survey that is being provided with this request. Certain data, including planned utility construction, is included in the survey files that was not yet completed. The contractor is advised to further field survey the site to update the survey data to current conditions existing on the site and to verify that construction was completed as planned. Any survey information required by the Contractor not provided with this request hall be procured and paid for by the Contractor.

1.4 STAGING AND CONTRACTORS ACCESS

1.4.1 Staging Area

The location of the Contractor staging area shall be as shown on the Location Plan. Staging area shall be returned to its original condition upon completion of construction.

1.4.2 Contractors Access Route

The Contractor's access route to the project location shall be approximately as shown on the Location Plan.

1.5 DEMOLITION AND REMOVAL

The Contractor shall remove all pavement, utilities, trees, and structures as required to design and construct the new Physical Fitness Center. Underground utility lines and below-grade rubble that have been abandoned on the site shall be removed by the contractor when they interfere with, or jeopardize the quality of the new construction. Asbestos-covered steamlines known to have been abandoned on the site, electrical structures and lines and a security fence installed for current construction activities will be removed by others prior to the construction start date for the Physical Fitness Center. Two electrical lines running through the site will be relocated, and an electrical switch box installed, also by others, prior to the Physical Fitness Center's construction start date. See approximate location of the switchbox on the attached electrical drawings.

All materials shall be disposed of outside the limits of Government controlled lands. Disposals shall be in accordance with federal, state, and local regulations. The Contractor shall notify the Contracting Officer if any material to be disposed of is found to contain hazardous, toxic, biological or radiological substances. Rubbish and debris shall be removed from Government property daily to avoid accumulation at the project site. Demolition shall conform to UFGS Section 02220A DEMOLITION.

1.6 NEW CONSTRUCTION

The location and construction of the new Physical Fitness Center, access drives, walks, parking, utilities and landscaping shall be as indicated on the attached drawings and in these specifications.

1.6.1 Building

The general location of the Physical Fitness Center shall be as shown on the drawings. However, the exact location may be revised slightly by the Contractor as needed to accommodate the final project layout. Two ballfields and a dining facility are planned for future construction at the approximate locations shown on the attached drawings; any revisions to the site layout shall consider the future construction projects. The building shall be setback 80 feet from roads, drives, and parking lots. All site layout shall be subject to approval by the Government. The new building is required to be handicapped accessible.

1.6.2 Entrance Walks.

A 16-foot wide main entrance walk, and an 8-foot wide north entrance walk shall be constructed. **If the HAWC Bid Option Item is exercised, an 8-foot wide HAWC entrance walk shall also be constructed.** The entrance walks shall be 4-inch thick, light-broom-finished concrete and have a square and rectangular pattern formed by expansion and contraction joints placed at 4 foot and 8 foot intervals. Colored concrete shall be used in the walk

areas of the 4-foot squares and 4x8-foot rectangles, as indicated on the attached Site Plans. Concrete shall be integrally colored (colored prior to installing.) The color chosen shall match the building color and be coordinated with the base. Structural stoops in areas of colored concrete walk, shall also be integrally colored concrete. Planting islands shall be inset in both the main and north entrance walks. See layouts on attached Site Plan. Minor alterations may be made to the design of the entrance walks as the site design is further developed. An accessible ramp shall be provided at the intersection of the main entrance walk and drop-off lane.

1.6.3 Walks

Exterior concrete walks shall be constructed as indicated on the attached Site Plans. Walks shall be 4-inch thick concrete and have a medium broom finish. Walks along the parking lots shall be 8' wide with joint spacing at 8-foot intervals. The walk on the west side of the building shall be 6-foot wide with joint spacing at 6-foot intervals. Curb cuts shall be provided for handicapped accessibility at intersections of drives and walks. **Walks shall be modified to facilitate building bid item options that are being exercised.**

1.6.4 Parking

Privately-owned vehicle parking shall be provided as shown on the attached Site Plans.

1.6.4.1 76-Stall Lot

A 76-stall asphalt parking lot with concrete curb and gutters shall be constructed on the front (south) side of the new Physical Fitness Center. The lot shall have a central entrance design, with a 14-foot drive on each side of a circular island with a 25-foot radius. The circular island shall be bermed into a low, uniform mound, and planted with a variety of low shrubs. The 14-foot drives shall be designed for one way traffic flow, and striped accordingly. An "Enter" and "Exit" sign shall be provided to advise traffic from Steamboat Avenue of their direction. The signs shall be small, low profile signs, 2-1/2 feet high, and placed on the outside (not the island side) of the drives. Striping shall be provided for a 12-foot wide, passenger-unloading lane. Four of the 76 parking stalls shall be reserved for handicapped parking; the stalls shall be van-accessible, or universal stalls. Five additional standard parking stalls shall be provided on the rear (north) side of the building, off of a new connector drive that abuts the existing apron at the gas station and leads to the mechanical rooms on the north side of the new Physical Center.

1.6.4.2 117-Stall Lot

As an option, a 117-stall parking lot shall be constructed on the rear (north) side of the facility. If this option is exercised, the new connector drive between the gas station and the mechanical rooms will be eliminated, and a new access drive from Eldora Street shall be provided. Four additional van-accessible stalls shall be designated in the option parking lot. The option parking lot includes all striping, signage, lighting, grading, and storm drainage.

1.6.4.3 General Requirements

Striping, signage, and ramps shall be provided for all handicapped stalls as required by the ADAAG January 1998 Accessibility Guidelines for Buildings and Facilities and the Appendix. Any adjustments to the parking lots as shown must be approved by the Government. Regular parking stalls shall be a minimum of 9 feet wide by 18 feet long. Driving lanes shall be a minimum of 24 feet wide. Parking stalls shall be delineated with 4-inch wide, white stripes. Provide inside turning radii of 25 feet at the intersections with roads; 15 feet into the parking lots and into driving aisles; and 5 feet into parking stalls. Provide concrete curb and gutter as shown on the attached Site Plans. Asphalt connector drive and drive providing access to the the option parking lot shall be 24 feet-wide.

1.6.5 Service Walks/Drives

The contractor shall provide one 16-foot wide concrete service drive. **An additional 14-foot wide asphalt service drive shall be constructed if the HAWC Option is awarded.** The drives shall be asphalt pavement with concrete curb and gutter. Collapsible bollards shall be installed in the drives 80' out from the building. The bollards shall be placed to prevent entry onto the drive by unauthorized vehicles when they are upright, and designed to be released by a hydrant wrench. Upon release, the bollards shall drop parallel to the ground by pivoting on an anchor base installed at grade level. The bollards shall lock back into place by lifting into an upright position.

1.6.6 Dumpster Screenwall Enclosure

A concrete pad and dumpster screenwall enclosure shall be provided at the location shown on the attached Site Plan. A minimum distance of 80 feet between the building and dumpster location is required. An existing enclosure located at Building 26, east of the project site shall be used as a guide in the design of the new enclosure. The screenwall enclosure shall be a minimum of 14'-8" x 13'-4" x 7'-0" high and constructed of burnished and split-face blocks to match the new Physical Fitness Center's exterior walls. The vehicle-access side of the enclosure shall have a 12-foot wide opening with a double-swing gate constructed of 2-inch x 3/8" bars and 3/4-inch square steel tubes. A gate keeper, capable of holding the gates in an open position, and a locking mechanism shall be integrated into the gate design. A 4-foot wide pedestrian opening shall be provided on the south side of the enclosure. Metal flashing shall be provided on top of the block walls.

1.6.7 Bicycle Racks

Bicycle racks of heavy-duty construction shall be provided for 26 bicycles in the location shown on the attached Site Plans. Racks shall be positioned to allow for the installation of racks for an additional 26 bicycles. Rack style and color shall be coordinated with the base.

1.6.8 Landscaping

All sodded areas and trees and shrubs provided by this contract shall be irrigated. Landscape plan shall be designed to visually enhance the new facility with color, form and screening, while providing shade and windbreak for the new building. Trees and shrubs close to the building shall be very low-growing evergreen shrubs with ornamental trees and small, open shrubs. Larger and denser trees and shrubs shall be planted at least 30 feet from the building. Trees and shrubs shown on the Site Plans are

indicative of areas to be landscaped and do not necessarily type or quantify. **A Landscaping Option may be exercised. The Landscaping Option will include landscaping plants for those areas showing plants on Sheet P3.02 that are not shown on Sheet P3.01. Additional shrubs shall also be provided in a plant bed if the HAWC Option is exercised. All plants shall be drip or bubbler irrigated.**

The Landscape Plan will include the following plantings:

TYPE		MINIMUM QUANTITY (EACH)			MINIMUM SIZE
		Basic	Add'l for Landscaping Option	Add'l for Hawc Option	
TREES					
Deciduous	Shade	6	8	0	4" caliper
Deciduous	Ornamental	20	0	0	2" caliper
Conifers		2	2	0	6' high
		2	3	0	8' high
		3	7	0	10' high
SHRUBS					
Deciduous &	Evergreen	78	30	18	5 gal.

Landscaping shall consist of low-maintenance, balled and burlapped trees and container-grown shrubs. Plant materials shall be climatized to the local area for a period of one growing season prior to planting and consist of plants known to thrive in the area. Native vegetation with low water use characteristics will be used if available. Mulch trees to a minimum diameter of 5 feet, or 2 feet beyond the tips of tree branches with a 4 inch to 6 inch depth of locally-purchased shredded wood from 1/2 inch to 3/4 inch size. All shrub planting beds shall be surfaced with a commercial weed-barrier fabric and a 3-inch thick surface of 1 inch to 2 inch size of decorative rock mulch. The contractor shall coordinate with the base on the type of rock mulch desired. All plant beds not edged by walks and drives shall be edged with a integrally-colored concrete edging, 12"-wide and 8" deep. The edging shall protude 1.5" above finished grade. The edging shall have a 1/2" chamfer on the outside edge, and have contraction joints at 8' on center. Contractor shall be responsible for maintaining new plant material in a healthy growing condition beginning with the completion of the last day of planting operation for a period of 12 months. Landscape plantings shall be specified in UFGS 02930A EXTERIOR PLANTING and 02935A EXTERIOR PLANTING MAINTENANCE.

1.6.9 Turf

1.6.9.1 Soil Preparation

Prior to seeding or sodding, all surface soils shall be loosened to a minimum depth of 12 inches and broken up to a fine, workable texture suitable for seeding and sodding. Areas within the limits of sod and irrigation shall have 3 cubic yards per 1000 square feet of manure worked into the top 6 inches of soil.

1.6.9.2 Seeding and Sodding

Areas shall be seeded or sodded or indicated on the attached Site Plans. All other areas disturbed by construction and demolition activities,

including those disturbed by contractor's staging activities, not indicated to be otherwise surfaced, shall be seeded. All newly turfed areas shall be fertilized with no less than 200 lbs of 18-46-0 fertilizer per acre. All seeded areas shall be seeded by hydromulching techniques using 2000 lbs of green-tinted, wood-fiber hydromulch per acre, drilling with a Brillon-type seeder or broadcast seeded. Areas not hydromulched shall be mulched with hay at a rate of 2 tons per acre. Contractor shall be responsible for establishing a healthy stand of turf for a period of 90 days after turfing operations under this Contract are complete or until all work under this entire Contract has been completed and accepted, whichever period is longer. Seeding and sodding shall be specified in UFGS Sections 02921A SEEDING and 02922A SODDING.

1.6.9.3 Sod

All sodded areas shall be lawn irrigated with a irrigation sprinkler system. Sod shall be state-certified as classified by applicable state laws. Sod shall be locally grown and be comprised of a mixture of improved varieties of Kentucky Bluegrass with either Perennial Ryegrass and/or Creeping Red Fescue. It shall be free of thatch, diseases, nematodes, soil-borne insects, weeds or undesirable plants, stones larger than 2 inches in any dimension, woody plant roots and other material detrimental to a healthy stand of turf. Dry moldy, yellow, irregularly shaped, torn or uneven end sod pieces shall be rejected. Sod shall be machine cut to a uniform thickness of 1 inch within a tolerance of 1/4 inch, excluding top growth and thatch. Measurement for thickness shall exclude top growth and thatch. Sod anchors shall be used as recommended by the sod supplier.

1.6.9.4 Seeding

a. Seed Mixture

Mixture:	% Mixture	Rate
Canadian Bluegrass	10	
Crested Whatgrass (Ephraim)	30	
Blue Fescue	30	
Sheeps Fescue	30	
	<u>100%</u>	8 lbs per 1000 sf

Weed seed shall not exceed 1 percent by weight of the total mixture. Wet, moldy, or otherwise damaged seed shall be rejected. Seed mixing shall be performed by the seed supplier prior to delivery to the site. Bulk quantities of seed shall be labeled.

b. All seeded areas shall be watered with temporary lawn sprinklers for a period of sixty (60) days. Areas shall be watered as required for the ground to remain moist during the first three weeks of sprinkling. Beginning with the fourth week of sprinkling, the area shall be watered every other day, delivering 1/2 inch of water to the ground for each watering day, for the remainder of the sixty (60) day period.

1.6.10 Irrigation Sprinkler System

All sodded areas and landscape plantings shall be irrigated. The irrigation systems shall be specified in UFGS Section 02811A UNDERGROUND SPRINKLER SYSTEMS. See "Seeding" paragraph, above for temporary lawn sprinkling requirements.

a. The irrigation system shall consist of standard, commercially-

available components. The components shall be products of manufacturers regularly engaged in the manufacture of such items and shall essentially duplicate those that have been in satisfactory operation at Buckley AFB for at least two years.

b. The sprinkler system shall be completely underground, automatically operated by a central sprinkler controller, and capable of providing the required amount of water to the lawns and newly planted trees and shrubs as required in this contract. The system shall be equipped with weather sensors and be remote compatible. The lawn sprinkler pop-up heads shall be designed to be adjustable for coverage and flow. Trees and shrubs shall be watered by bubbler heads. Irrigation system shall operate through a backflow prevention device. Supply all necessary tools and equipment for complete installation.

c. Head spacing shall not be less than the manufacturer's recommendations for the type and sizes of trees and shrubs installed and the area of turf to be sprinkled. The Contractor shall submit design calculations for review on this matter. The Contractor shall also provide design drawings that include typical head spacing, system layout, pipe size, layout, and pressures. All components shall be shown on the irrigation plans for review.

d. A reduced pressure principle backflow preventer shall be installed between the irrigation system and the potable water system. A strainer shall be installed upstream of the backflow preventer with a screening element compatible with the emitters or sprinkler heads used and as recommended by the manufacturer. Provide a self-draining, freeze-proof, shut-off valve upstream of the backflow preventer and strainer. Vacuum breakers shall not be used in lieu of the reduced pressure principle backflow preventer. The system shall also be equipped with a quick coupler valve immediately outside the building for blowing water out of the system at the end of the season. The air connection shall be located downstream of the backflow preventer and strainer.

e. High points in the irrigation system shall be equipped with air vacuum relief valves.

1.7 CONSTRUCTION AREA/SAFETY FENCING.

The Contractor shall maintain a construction area fence throughout the duration of the contract. Fence shall be 4 foot tall orange plastic with gates. The fence shall be located such that the entire project site is fenced. Upon completion of construction, all fence materials shall be disposed of outside the limits of Government-controlled lands.

1.8 PAVEMENTS

1.8.1 Pavement Sections

The Contractor shall be responsible for design of all pavements using the traffic information provided below. Design of pavement structures for roads and parking areas shall be determined by the Contractor using the methods described within TM 5-822-5.

Paragraph 18-8 of TM 5-822-5 allows pavements with a design index of less than 4 to be designed using applicable state highway department requirements based on demonstrated satisfactory performance of pavements in that state. If the state highway department uses the AASHTO design method,

the following parameters shall be used:

Reliability = 90 percent
Standard Deviation = 0.35 for rigid and 0.45 for flexible pavement
Initial Serviceability Index = 4.2
Terminal Serviceability Index = 2.5

Pavements for permanent installations shall be designed for a life of 25 years. Pavements at Buckley AFB shall be designed for seasonal frost conditions. Soil data for pavement design shall be obtained from the attached Final Foundation Analysis. See end of the RFP, Attachment No. 2.

1.8.2 Design Traffic

Pavement for all parking areas shall be full depth asphalt with concrete curb and gutter. Design shall be for a class "F" facility with a traffic category of II. Traffic will be composed of 90 percent passenger cars, panel trucks and pickup trucks, and up to 10 percent two-axle trucks.

Pavement for connector drive, service drives, and parking lot access drives shall be full depth asphalt with concrete curb and gutter. Design shall be for a class "E" facility with a traffic category of III. Traffic will be composed of 84 percent passenger cars, panel trucks and pickup trucks, 15 percent two-axle trucks, and 1 percent three-, four-, and five-axle trucks.

Pavement for the dumpster area shall be rigid p.c. concrete with rigid base course and integral concrete curb and gutter. Design shall be for a class "E" facility with a traffic category of III. Traffic will be composed of 84 percent passenger cars, panel trucks and pickup trucks, 15 percent two-axle trucks, and 1 percent three-, four-, and five-axle trucks.

1.8.3 Rigid Pavement Design Curves

Two curves are presented in Chapter 12 of TM 5-822-5 to determine the required thickness of plain concrete pavement. The curves in Figure 12-1 were developed assuming free edge stresses and should be used for roads and streets and other pavements where wheel loads will repeatedly travel near or over the pavement edge. Edges of concrete pavement designed using this curve are not required to be thickened. The curves in Figure 12-2 were developed assuming 25 percent load transfer across pavement joints. Figure 12-2 should be used for parking areas and storage areas where wheel loads will seldom travel near the pavement edge. Pavement edges will not require thickening except at entrances where wheel loads repeatedly cross the pavement edge. Figure 12-2 may be used for roads and streets if the pavement edges are thickened.

1.8.4 Rigid Pavement Joint Layout

A typical joint layout for plain concrete road intersections is shown in Figure 13-1 of TM 5-822-5. A typical joint layout for plain concrete roads and parking areas is shown in Chapter 15 of TM 5-822-5. Spacing and layout of joints in plain concrete pavement shall be such that the number of slabs requiring reinforcement will be kept to a minimum. Odd-shaped slabs should be reinforced in two directions normal to each other using a minimum of 0.05 percent of steel in both directions. The entire area of the slab should be reinforced. An odd-shaped slab is considered to be one in which the longer dimension exceeds the shorter dimension by more than 25 percent or a slab which essentially is neither square nor rectangular. Odd-shaped

slabs will generally be reinforced with steel welded wire fabric. Slabs in which a structure is placed shall also be reinforced with welded wire fabric. Each slab to be reinforced with welded wire fabric will be marked with an "R" on the joint layout plan. Details showing typical layout of joints at intersection as indicated in Figure 13-1 of TM 5-822-5 will be provided when applicable.

1.8.5 Sidewalks

P.C. concrete sidewalks shall be a minimum of 4 inches thick. Expansion joint spacing shall not exceed 40 feet.

1.8.6 Utility Crossings

All utilities will be tunneled or bored under existing streets.

1.8.7 Pavement Specifications

Pavements shall be constructed in accordance with Colorado Highway Specifications where indicated. Unless otherwise specified, unit price clauses in specifications shall be deleted. These requirements shall be incorporated into the Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS. An unedited copy of Section 02560 is included at the end of RFP, Attachment No. 4. The Contractor shall be responsible for editing this specification.

1.8.7.1 Bituminous Wearing and Intermediate Courses

Bituminous wearing and intermediate courses shall conform to the requirements in the Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS. The maximum size aggregate used in bituminous concrete shall be approximately equal to, but always less than 1/2 the wearing course thickness and 2/3 the intermediate course thickness. The total thickness of bituminous concrete shall not be less than 2 inches. Where the total thickness of bituminous concrete requires more than one lift, an intermediate course may be specified beneath the wearing course.

Disintegrated granite shall not be used for production of any aggregate and the processed aggregate shall contain not more than 2.0 percent by weight of disintegrated granite particles in that portion of the total sample larger than the 4.75 mm sieve and not more than 4.0 percent in any individual sieve size listed in the required aggregate gradation for that portion larger than the 4.75 mm sieve. A disintegrated granite particle is defined as a soft, crumbly particle of igneous rock having a visible crystalline grain size and consisting essentially of feldspar and quartz with lesser amounts of micas and/or amphiboles and pyroxenes. Generally, the rock particle will be stained by iron oxide and the feldspar grains will have a dull, highly fractured appearance. The individual mineral grains are so weakly bonded that the particle will crumble under moderate pressure. When tested by Test Method COE CRD-C 130 the particle would be classified as soft.

1.8.7.2 Bituminous Tack Coat

Contact surfaces of previously constructed pavement, curbs, manholes, and other structures shall be sprayed with a thin coat of bituminous material conforming to the requirements found in Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS. Unless otherwise

directed or required, bituminous material shall be emulsified asphalt conforming to the requirements of ASTM D 977, designation SS-1 or SS-1h or cationic emulsified asphalt conforming to the requirements of ASTM D 2397, designation CSS-1 or CSS-1h.

1.8.7.3 Rigid Base Course

Rigid base course shall be placed beneath P.C. concrete pavement. Rigid base shall conform to the requirements found in Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS.

1.8.7.4 P.C. Concrete Pavement

P.C. concrete shall conform to the requirements in the Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS.

1.8.7.5 Joint Sealing

Joints in P.C. concrete pavements shall be sealed with field molded sealants. Field molded joint sealants shall be specified in the Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS.

1.8.7.6 Concrete Sidewalks and Curbs and Gutters

Concrete sidewalks and curbs and gutters shall be specified in Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS. Expansion joints in P.C. concrete sidewalks shall be sealed with cold-applied sealant which is stone or grey in color.

1.9 GRADING

1.9.1 General

Positive drainage shall be provided for all areas and existing drainage ways shall be utilized to the extent possible. It is desirable to direct drainage away from buildings to curb and gutter or drainage structures. Swales between buildings and parking areas shall be avoided if possible. Parking areas shall be graded such that storm water is directed off to the sides, with curbs and gutters to control drainage, and not down the center of the parking area, where possible. Earthwork shall be balanced to the extent possible without compromising the design. The number of existing trees to be removed shall be kept to a minimum. No grading shall be done within drip lines of existing trees to be preserved. The Contractor shall coordinate all drainage improvements with the Buckley AFB storm drainage study. Grading shall be specified in Omaha District guide specification Section 02210 GRADING. An unedited version of Section 02210 has been included as an attachment. See end of the RFP, Attachment No. 4. The Contractor shall be responsible for editing the specification for the project.

1.9.2 Adjustment of Existing Structures

All manholes, valve boxes, or inlets of any nature within the project that do not conform to the new finish grade in either surfaced or unsurfaced areas shall be adjusted to the new finish grade. Where inlets, manholes, or valve boxes fall within a surfaced or unpaved roadway or parking, the existing frames and cover shall be removed and replaced with a heavy-duty frame and cover. The structure shall be adjusted as needed to fit the new

conditions. All structures shall be of a type suitable for the intended use and shall conform to the requirements of the applicable section of these specifications.

1.9.3 Borrow and Waste

Borrow materials shall be obtained from sources outside the limits of Government-controlled land. The source of borrow material shall be the Contractor's responsibility. The Contractor shall obtain from the owners the right to procure material, shall pay all royalties and other charges involved, and shall bear all the expense of developing the sources, including rights-of-way for hauling. Surplus excavated material not required for fill shall be disposed of by the Contractor at his own expense and responsibility outside the limits of Government-controlled land.

1.9.4 Sidewalks and Curb and Gutter

Concrete walks shall have a transverse grade of 2 percent. Maximum desirable longitudinal walk grade shall be 4 percent and an absolute maximum grade of 8.33 percent. Special attention shall be given to sidewalks that are on the north (shaded) side of buildings. These walks should be designed to ensure a freeze/thaw cycle does not result in the formation of ice on the walk. Ice on walks should be a safety consideration for all areas. The use of steps in walks will be avoided whenever possible. The use of single riser steps is especially discouraged. When steps are unavoidable, they should have at least three risers and will be provided with handrails.

1.9.5 Transverse Parking Area Grades

- a. Desirable minimum of 2 percent.
- b. Absolute minimum of 1.5 percent for flexible pavement and 1 percent for rigid pavement.
- c. Maximum of 2 percent at handicap parking.

1.9.6 Longitudinal Parking Area Grades

Maximum of 4 percent.

1.9.7 Ramp Grades

- a. Desirable maximum of 7 percent.
- b. Absolute maximum of 10 percent for short distances only.

1.9.8 Gutter Grades

- a. Desirable minimum of 0.8 percent.
- b. Absolute minimum of 0.5 percent.

1.9.9 Building Floor Elevation

The building site is within an airfield safety clearance zone. A maximum height for structures on this site is 5548 using NAD27 and NGVD29 in U.S. Survey Feet, Colorado Central Zone. Note that the survey being provided with this request was performed in different datum. Building finished floor elevation shall be set to ensure that the height restriction is met and the required minimum and maximum grades are met.

1.9.10 Grades Away From Building

- a. Minimum of 5 percent for 10 feet.
- b. Maximum of 10 percent for 10 feet.

1.9.11 Overlot Grades

Provide positive drainage for all areas.

- a. Minimum 1 percent for cohesionless sandy soils.
- b. Minimum 2 percent for cohesive soils or turfed areas.

1.9.12 Ditch Slopes

Minimum grade of 1.0 percent for channelized flow.

1.9.13 Ditches

Ditches shall be graded at non-erodible slopes or the ditch shall be lined with an appropriate material to prevent erosion. A design storm with a return period of at least 2 years shall be used to determine erodibility of ditches and swales. The depth of ditches along pavement shoulders shall be such that the water surface from the 10 year design storm is below pavement subbase and base courses which daylight through the adjacent shoulder.

1.10 ROAD GEOMETRIC DESIGN

Horizontal and vertical alignment shall be designed in accordance with AASHTO "A Policy on Geometric Design of Highways and Streets".

1.11 STORM DRAINAGE

1.11.1 Determination of Storm Runoff

For areas of up to about 1 square mile, where only peak discharges are required for design and extensive ponding is not involved; the computation of runoff will be accomplished by either the Rational Method or the method presented in TM 5-820-1. For larger areas, when suitable unit-hydrograph data are available or where detailed consideration of ponding is required, computation should be by unit-hydrograph and flow-routing procedures. If the method presented in TM 5-820-1 is used to determine the peak discharge, the minimum time of concentration for turfed or paved areas shall be 5 minutes.

1.11.1.1 Design Storm Return Period

Storm drains and culverts shall be sized for a design storm with a return period of 10 years. Provisions shall be made to protect all buildings and critical structures from a major storm event with a return period of 100 years.

1.11.1.2 Rainfall Depth-Duration-Frequency Data

Rainfall data for states in the western United States shall be obtained from NOAA ATLAS 2. Rainfall intensity-duration data developed by cities or regions may be used if available.

1.11.2 Storm Drainage System Design

The Contractor shall be responsible for the complete design of the storm drainage system. The new storm drainage system shall be coordinated with surrounding properties to ensure runoff does not cause damage to the other properties. The use of existing and or new storm water detention areas is encouraged. Storm water shall be collected by an underground storm drainage system for all the turfed areas surrounding the building and for all paved areas with curb and gutter. The Contractor shall coordinate all drainage improvements with the Buckley AFB storm drainage study.

The storm drainage system shall be specified in UFGS Section 02630A STORM-DRAINAGE SYSTEM. Submittal of pipe samples is not required. The Contractor shall refer to the Corps of Engineers standard details for any storm drain details required by the design. The standard details are available at the Corps FTP site. The Contractor shall provide details for any other drainage structures not found in the Corps standard details.

The storm drainage system shall be designed so as to minimize the number of drainage structures required. Structures shall be located at all changes in direction of storm drain line, at the intersection of two or more storm drain lines, and where required to intercept rainfall runoff. The maximum distance between drainage structures shall be approximately 300 feet for conduits less than 30 inches in diameter. The maximum distance between drainage structures shall be approximately 500 feet for conduits 30 inches and greater in diameter.

Storm runoff in streets and parking areas with curbing shall be collected using curb inlets or area inlets. The use of curb openings with flumes to drain water from streets and parking areas with curbing shall not be permitted unless approved by the Government. Drainage of runoff from turfed areas onto pavements shall be minimized. Where possible, a minimum drop of 0.2 feet between inverts of equal diameter storm drain pipes shall be provided at the centerline of drainage structures. Where storm drain pipes are of different diameters, the pipe crown elevations should be matched at the drainage structure. Storm drain pipes shall have a minimum diameter of 12 inches. Storm drain lines shall be located outside of paved areas to the extent possible. Under no circumstance shall storm drain lines be located beneath buildings.

1.11.2.1 Hydraulic Design

New storm drain pipes shall be designed for gravity flow during the 10-year design storm unless otherwise approved by the Government. The hydraulic grade line shall be calculated for the storm drain system and all energy

losses accounted for. Storm drain systems shall be designed to provide a minimum flow velocity of 2.5 feet per second when the drains are one-third or more full.

1.11.2.2 Manholes

Diameter of manholes shall be large enough to accommodate pipes entering/exiting the manhole. Manhole cast iron frames shall have a minimum opening diameter of 24 inches. Galvanized steel ladders shall be provided in all manholes with a depth exceeding 12 feet in accordance with UFGS Section 02630A STORM-DRAINAGE SYSTEM.

1.11.2.3 Area Inlets

Area inlets shall be properly sized and designed to accommodate the design flows.

1.11.2.4 Curb Inlets

Locating parking area curb inlets at building entrances shall be avoided if possible. Curb inlets along two-lane streets shall be spaced and sized so that the flow in the gutter and ponded areas at low points do not cover the crown of the street.

1.11.2.5 Headwalls and Flared End Sections

Unless otherwise approved, headwalls or flared end sections shall be provided at the ends of culverts and at storm drain outfalls. Protection from erosion and scouring at headwall and flared end section outfalls shall be provided as needed.

1.11.2.6 Culverts

Culvert pipes shall have a minimum diameter of 18 inches wherever possible.

1.11.3 Downspouts and Roof Drains

Downspouts and roof drains shall be connected to an underground drainage system. Roof drain outfall lines beyond 5 feet from the building shall be of the same materials as the exterior storm drainage system. Minimum diameters shall be 12 inches for lengths over 50 feet and 8 inches for lengths under 50 feet. In addition, the diameter shall be at least 2 inches larger than the diameter of the line as it leaves the building. All changes in direction of outfall lines shall occur at storm drain structures except that cleanouts may be used in lines smaller than 12 inches.

1.11.4 Subsurface Drainage Requirements

Positive drainage of the area under and around the pool and the footings shall be provided using a subdrainage system. If drilled piers are used, only the area under and around the pool shall have a subdrainage system. The Contractor shall be responsible for complete design of the subdrain system. Minimum diameter shall be 8 inches. The distance between the laterals under the pool area shall be no more than 4 feet apart. In addition, the diameter shall be at least 2 inches larger than the diameter of the line as it leaves the pool area. All changes in direction of outfall lines shall occur at storm drain structures except that cleanouts may be used in lines smaller than 12 inches. The invert of subdrains which discharge into storm drain structures shall be placed above the 10-year

hydraulic grade line elevation at the structure. Subdrainage system shall be specified in UFGS Section 02620A SUBDRAINAGE SYSTEM. Clay drain tile and porous concrete pipe shall not be used for subdrains.

1.11.5 Storm Drain and Culvert Pipe

The Contractor shall select the appropriate storm drain and culvert pipe materials from the options specified in UFGS Section 02630A STORM-DRAINAGE SYSTEM. Pipe, bedding, and backfill shall be of adequate strength (or stiffness) to support the earth, live, and construction loads imposed on the pipe. Only pipe materials which have a minimum design service life of 50 years shall be allowed for permanent installations. As a minimum, all pipe joints shall be soil tight. The Contractor shall specify watertight pipe joints and flexible resilient pipe connectors at drainage structures when the water table is at or above the pipeline.

1.11.5.1 Concrete Pipe

Reinforced concrete pipe shall be a minimum Class III. Type I cement may be used only when sulfates in the soil are 0.1 percent or less and dissolved sulfates in the effluent are 150 ppm or less. Type II cement may be used only when sulfates in the soil are 0.2 percent or less and dissolved sulfates in the effluent are 1,500 ppm or less. Only Type V cement may be used if sulfates in the soil exceed 0.2 percent or dissolved sulfates in the effluent exceed 1,500 ppm. Concrete pipe shall be assumed to have a minimum design service life of 50 years unless the Contractor determines that conditions at the site will reduce the service life. Concrete culverts and storm drains shall be protected by a minimum of 3 feet of cover during construction to prevent damage before permitting heavy construction equipment to pass over them during construction.

1.11.5.2 Corrugated Metal Pipe

The service life of corrugated metal pipe shall be the sum of the lives of the nonmetallic protective coating, the metallic protective coating, and the basic metal pipe. The life of the basic metal pipe and metallic protective coating shall be the time to first perforation. The time to first perforation for corrugated steel pipe shall be determined using the California Chart (California Division of Highways Test Method 643-B). Corrugated metal pipe shall not be allowed in areas where previous satisfactory service has not been achieved. Zinc-coated corrugated steel pipe shall not be allowed if the soil and water pH is less than 6 or greater than 8 or the minimum soil resistivity for the site is less than 2,500 ohm-cm. Aluminum-coated corrugated steel pipe shall not be allowed if the soil and water pH is less than 6 or greater than 9 or the minimum soil resistivity for the site is less than 1,500 ohm-cm. Bituminous coatings shall have a maximum allowable add-on service life of 10 years on the soil side and 2 to 10 years on the water side of the pipe. Stiffness of the corrugated metal pipe and soil envelope shall be such that the predicted long-term deflection shall not exceed 5.0 percent. Corrugated metal culverts and storm drains shall be protected by a minimum cover as recommended in Section 26 of AASHTO HB-16 during construction to prevent damage before permitting heavy construction equipment to pass over them during construction.

1.11.5.3 Plastic Pipe

Stiffness of the plastic pipe and soil envelope shall be such that the predicted long-term deflection shall not exceed 7.5 percent. Plastic

culverts and storm drains shall be protected by a minimum of 3 feet of cover during construction to prevent damage before permitting heavy construction equipment to pass over them during construction. Split couplers shall not be allowed for corrugated high-density polyethylene pipe. Plastic pipe shall be assumed to have a minimum design service life of 50 years unless the Contractor determines that conditions at the site will reduce the service life.

1.12 TRAFFIC SIGNAGE AND STRIPING

Traffic signage and striping shall be provided for all new roads and parking areas. Signage and striping shall be designed in accordance with the ANSI D6.1 Manual on Uniform Traffic Control Devices for Streets. Parking areas shall be striped with non-reflectorized paint. Roads and streets shall be striped with reflectorized paint. Traffic signs shall be specified in Omaha District guide specification Section 02440 TRAFFIC SIGNS. An unedited version of Section 02440 has been included as an attachment. See end of the RFP, Attachment No. 4. The Contractor shall be responsible for editing the specification for the project. Pavement markings shall be specified in UFGS Section 02763A PAVEMENT MARKINGS.

1.13 EROSION AND SEDIMENT CONTROL

The Contractor shall be responsible for selecting and implementing Best Management Practices (BMPs) to minimize pollutants in storm water discharges associated with construction activity at the construction site. All erosion and sediment measures and other protective measures shall be maintained by the Contractor in effective operating condition. All temporary structural practices shall be removed once the corresponding disturbed drainage area has been permanently stabilized. In the State of Colorado, EPA has authority for the National Pollutant Discharge Elimination System (NPDES) on Federal Facilities. If construction activities results in the disturbance of 5 acres of land or more, coverage under the EPA Storm Water General Permit For Construction Activities (Colorado Permit No. COR10*##F) is required. The Contractor and the Omaha District Corps of Engineers shall be co-permittees. The Contractor shall be responsible for complying with the requirements in UFGS Section 01355 ENVIRONMENTAL PROTECTION and with the requirements of Omaha District guide specifications Section 01565 NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES. The Contractor shall be responsible for editing and applying the requirements of Omaha District guide specifications Section 01356 STORM WATER POLLUTION PREVENTION MEASURES. An unedited guide specification Section 01356 have been included as attachment. See end of the RFP, Attachment No. 4. Guide specification Section 01565 has been included as attachment. See end of the RFP, Attachment No. 4. If coverage under the NPDES Permit is not required, Specification Section 01565 shall not be applicable.

1.13.1 Temporary Construction Entrance

Tracking of mud from the construction site onto adjacent roads and streets shall be kept to a minimum. A temporary stabilized stone pad shall be constructed at points where vehicular traffic will be leaving the construction site and moving directly onto a paved road or street. It shall extend the full width of the vehicular ingress and egress area and have a minimum length of 70 feet. The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto adjacent roads or streets. If conditions on the site are such that the majority of the mud is not removed by the vehicles traveling over the stone, the the tires of

the vehicles shall be washed before entering the road or street. Any mud which is tracked onto roads or streets shall be removed at least once daily.

1.13.2 Seeding and Sodding

All areas disturbed by construction and not otherwise surfaced shall be seeded or sodded. Areas to be sodded shall be as indicated on the drawings.

1.13.3 Erosion Control Blanket

Bottoms and side slopes of ditches and any other disturbed slopes 1V on 3H or steeper shall be covered with an erosion control blanket immediately after seeding.

1.13.4 Silt Fence

Silt fencing shall be installed below disturbed areas where erosion would occur in the form of sheet and rill erosion. The size of the drainage area above the silt fence shall not exceed one fourth of an acre per 100 feet of silt fence length. Silt fencing may be installed across ditches only when the maximum contributing drainage area is not greater than 1 acre. Silt fence constructed across a ditch shall have wire support and shall be of sufficient length to eliminate end flow.

1.13.5 Straw Bale Barrier

Straw bale barriers may not be installed across ditches.

1.13.6 Outlet Protection

Preformed rip rap lined scour holes or other suitable measures shall be installed at outlets of culverts and storm drains as needed to prevent erosion.

1.13.7 Storm Drain Inlet Protection

Storm drain inlet protection shall be installed around any new or existing storm drain inlets that will become operational before permanent stabilization of the corresponding disturbed drainage area has occurred. Storm drain inlet protection shall include either a sediment filter or an excavated area around the storm drain inlet.

1.13.8 Rock Check Dam

Rock check dams may be installed in ditches which drain 2 to 10 acres. The allowable drainage area will be dependent on the gradation of the rock used to construct the check dam. The maximum height of the dam shall be 3 feet.

The center of the dam shall be at least 6 inches lower than the outer edges. For added stability, the base of the check dam may be keyed into the soil approximately 6 inches. The maximum spacing between the dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.

1.13.9 Temporary Sediment Trap

Temporary sediment traps may be constructed below disturbed areas where the total drainage area is less than 3 acres.

1.13.10 Temporary Sediment Basin

Temporary sediment basins may be constructed below disturbed areas where the total drainage area is equal to or greater than 3 acres.

1.13.11 Other Controls

Other controls such as diversion dikes, level spreaders, temporary seeding, etc. may be used if deemed necessary by the Contractor.

1.14 UTILITIES

The Contractor shall avoid running utilities underneath buildings, streets, and parking lots where at all practicable. In cases where it is necessary for the utilities to cross existing streets, the Contractor shall install the lines by boring and jacking methods. No open trenching will be allowed through existing streets unless written permission is obtained and approved by Buckley AFB.

1.14.1 CATHODIC PROTECTION

Corrosion protection shall be provided for all buried gray or ductile-iron piping, fittings, valves, and other water line appurtenances, regardless of pipe material. Corrosion protection shall consist of an anode type cathodic protection system. See Section 01007 Electrical Requirements.

1.14.2 WATERLINES

a. All waterlines shall comply with applicable Local, State and Federal standards. Local and State standards shall dictate unless the Federal standards are more stringent. Water distribution systems and service lines shall be designed and constructed in accordance with TI 814-1 and TI 814-3, applicable U.S. Army Corps of Engineers Guide Specifications requirements. The Contractor shall be responsible for protection of existing waterlines. If any potable waterlines are damaged during construction, the Contractor must immediately notify the Base Civil Engineering (CE) Office. The Contractor shall disinfect all new water lines and any remaining lines which do not remain fully pressurized during construction or connection. The Contractor shall notify the Base CE Office prior to disinfection of the water lines. The disinfection shall be in accordance with the American Water Works Association Standard AWWA C651,(1992), and shall not be considered complete until two consecutive days of bacteriological samples show no contamination. All bacteriological, lead and copper tests shall be performed by Environmental Protections Agency (EPA) certified laboratories. Copies of results of the analyses shall be forwarded to the Contractor upon receipt.

b. The Contractor shall design and provide all facilities required to deliver water to the project. Service connections or extensions to the existing water distribution system shall be made without interruption to service. The domestic demand for the new facility served shall be designed in accordance with the Uniform Plumbing Code Fixture Count Method. For design of the waterlines, use maximum Hazen-Williams "C" value of 130 for plastic pipe and 120 for other pipe materials.

1.14.2.1 Water Distribution and Service Lines

a. Flow Requirements

Water shall be supplied by service lines of appropriate capacity to provide the flows determined to be necessary to meet all requirements of the new facility. A distribution line shall be included south of the building, and the service lines connected in a loop, providing water to the facility from two directions. The requirements include all domestic use, interior and exterior fire protection water, and lawn sprinkler/irrigation systems, as required.

b. Service Connections

A maximum velocity of 10 feet per second shall be used for metallic piping and 5 feet per second shall be used for nonmetallic piping. Service connections shall be made via corporation stops, appropriate gooseneck connections, or tapping sleeves and valves. The number and maximum size of corporations stops shall be as specified in the UFGS Section 02510A WATER DISTRIBUTION SYSTEM.

c. Dewatering, Hydrostatic Testing, and Flushing of Lines

The Contractor shall be responsible for implementing the terms and requirements of UFGS Section 01355 ENVIRONMENTAL PROTECTION for dewatering, hydrostatic testing, and flushing of lines after disinfection.

d. Domestic Service Stop Valve

Building shall be provided with separate service and stop valves in areas readily accessible to maintenance and emergency personnel. Stop valves located in walks are prohibited.

1.14.2.2 Dedicated Fire Water Service Lines

a. Fire Flow Data

For determination and documentation of fire protection, the Contractor shall conduct and provide all fire hydrant flow tests. Data to be included with the flow tests are static pressures, residual pressures, flowrates, date and time tests were conducted, and name of personnel conducting the fire hydrant flow tests. The static pressures, residual pressures, flowrates, test hydrant and flow hydrants shall be shown on the appropriate contract drawings. Fire hydrant flow tests required for fire protection design shall be made in accordance with the procedures specified in AWWA M17, 1989 (Installation, Field Testing, and Maintenance of Fire Hydrants). The Contractor shall coordinate with the Buckley AFB Fire Department and Base CE prior to conducting such tests. The Contractor shall submit fire hydrant flow test data with the design calculations. The Contractor shall become familiar with the water system at Buckley AFB prior to conducting the hydrant flow tests. Existing hydrant flow test is provided for bidding purposes only. The hydrant test data is as follows:

Test Hydrant: located at Eldora and Winter Park

Flow Hydrants: near dormitory

Static: 81 psi

Residual: 57 psi

Residual Flow: 1062 gpm

b. Fire Hydrants

The Contractor shall be required to install fire hydrants for the new

facility. One fire hydrant shall be located within a minimum of 150 feet of the building fire department connection. All other hydrants shall be located in accordance with MIL-HDBK-1008C. Fire hydrant styles shall meet the requirements of Buckley AFB.

c. Dedicated Fire Line

The Contractor shall be required to provide a separate fire water service line to the building for interior fire sprinkler protection in accordance with NFPA 24, 1995, and MIL-HDBK-1008C. The fire water service line to the building shall be equipped with a Post Indicator Valve (PIV) that can be readily located by the fire department. The PIV shall not be placed closer than 40 feet to the building it is serving and shall be provided with a tamper switch connected to the building fire control panel. The PIV shall be protected by 6 inch steel pipe bollards, filled with concrete, painted and spaced in accordance with Buckley AFB requirements.

1.14.3 WASTEWATER

All wastewater lines shall comply with applicable Local, State, and Federal standards.

1.14.3.1 Design Criteria

Sewage system shall be designed and constructed in accordance with State and local criteria unless the Federal standards are more stringent. If the Federal standards are more stringent, the sewage system shall be designed and constructed in accordance with TI 814-10 and applicable U. S. Army Corps of Engineers Guide Specifications. The Contractor shall field verify the sanitary sewer system capacity and invert elevations to ensure that it is adequate for the flows generated by the new facilities. No interruption of service shall be allowed on the existing sanitary sewer line. The Contractor shall coordinate the sequencing of construction as it affects the existing sanitary sewer line with the Base CE Office. Exterior building sanitary sewer service lines shall be 6 inch minimum diameter. The minimum pipe size between manholes shall be 8 inches. All design slopes will be calculated using the Manning formula. The Contractor shall provide all calculations.

1.14.3.2 Manholes

Manholes are required at all changes of direction, slope, and size. Manholes shall be spaced not more than 300 feet apart. Manholes shall be located at intersections of streets when possible. Avoid placing manholes where the tops will be submerged or subject to surface water inflow. Where the invert of the inlet pipe would be more than 1.5 feet above the manhole floor, a drop connection will be provided. The Contractor shall provide all calculations.

1.14.4 Gas Distribution System

See Section 01006 MECHANICAL REQUIREMENTS for instructions and engineering information relating to the design of the exterior gas distribution system.

A narrative of the gas distribution design and applicable criteria used shall be provided. Include the peak and average flow demands, the flowrate required and the available pressures. A description of the gas distribution system, a listing of allowable piping materials, test data and preliminary calculations necessary to support equipment, piping sizes, flow

demands, etc., shall be provided similarly to water supply and distribution system.

1.15 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

1.15.1 Trenches

Jacking and boring shall be required when an underground utility line crosses any roadway. Sewer and water lines, mains or laterals, shall be placed in separate trenches. The separate trenches shall maintain a minimum horizontal separation of 10 feet and the bottom of the water line shall be at least 1.5 feet above the top of the sewer. Sewers crossing above potable water lines shall maintain a vertical separation of 18 inches and must be constructed of suitable pressure pipe or fully encased in concrete for a distance of 10 feet on each side of the crossing.

The trench shall be excavated as recommended by the manufacturer of the pipe to be installed. Bedding and initial backfill material shall be in accordance with the manufacturers recommendations. Where no manufacturer's installation manual is available, trench walls shall be excavated to a stable angle of repose as required to properly complete the work. Trench excavations shall adhere to requirements prescribed in EM 385-1-1, September 1996, Safety and Health Requirements Manual. Special attention shall be given to slopes which may be adversely affected by weather or moisture content.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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SECTION 01003

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- 1.8.23 Ergometry Testing Stations #113-120
- 1.8.24 Computer Library #129
- 1.8.25 Library/Lounge area #127
- 1.9 CASEWORK AND COUNTERTOPS

PART 2 NOT USED

PART 3 NOT USED

-- End of Section Table of Contents --

SECTION 01003

ARCHITECTURAL BUILDING REQUIREMENTS

PART 1 ARCHITECTURAL BUILDING REQUIREMENTS

1.1 FUNCTIONAL PLAN REQUIREMENTS

The architectural component of the project consist of a two story facility.

This building will house the following areas:

Lobby space with juice bar and lounge area, control counter, , and waiting areas. An administrative area with offices, break room, equipment storage and laundry area. A gymnasium with a running track above the gym floor along the perimeter, four racquetball courts, three Group Exercise rooms, Weight room for free and resistive weight training Lap pool with two spas, and a cardiovascular workout room located on the second floor. Public men's and women's toilets, locker rooms toilets and showers areas, distinguish visitor locker rooms storage rooms. The Health and Wellness Center "HAWC" will include a reception/lobby area, office spaces, classroom, computer library, Ergometry testing stations, wellness assessment rooms, resource library, food demonstration area Men' and Women's toilet, janitor closet, and storage area. Mechanical, electrical and communications spaces.

The layout of the mechanical, electrical and communication spaces are suggestive and may require wall configurations to be slightly altered to conform with equipment requirements.

Fire separation walls and egress from the facilities shall meet or exceed the requirements of NFPA 101 - Life Safety Code. See Section 01008 FIRE PROTECTION REQUIREMENTS. This facility shall include a fire sprinkler system which protects the entire building.

1.2 DESIGN CRITERIA

The technical specifications provided shall serve as the minimum design standards established for this project. Design publications listed in each specification section shall be used as sources of criteria for design. The criteria from these sources may be supplemented, but not supplanted, by applicable criteria contained in nationally recognized codes, standards, and specifications.

1.2.1 TECHNICAL SPECIFICATIONS

The government-provided technical guide specifications (available to Contractor as identified in Section 01332 and Attachment No. 3) shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product and installation requirements for this facility.

The provided specifications define the minimum requirements and level of quality for items of equipment, materials, installation, and testing that shall be provided for the facility. Where items of equipment, materials, installation, or testing requirements are not covered in the provided

specifications; special sections or within each guide specification or new specifications sections shall be prepared to cover those subjects.

1.2.2 PUBLICATIONS

The design publications listed below shall be used as sources of criteria for the architectural design. The most current edition of the code or standard shall be used as criteria for the design. The criteria from these sources may be supplemented but not supplanted, by applicable criteria contained in nationally recognized codes, and standards.

1.2.2.1 National Fire Protection Association

Life Safety Code #101, most current addition

NFPA 80 Fire Doors and Windows, most current addition

1.2.2.2 International Conference of Building Officials

(1997 Edition) Uniform Building Code

1.2.2.3 Military Handbooks

MIL HDBK 1190 - Facility Planing and Design Guide
Dated 1 September 1987\

Military Handbook 1008C Fire Protection for Facilities (1997)

1.2.2.4 American with Disabilities Act (ADA)

Accessibility Guidelines for Buildings and Facilities

1.2.2.5 Not Used

1.2.2.6 Occupational Safety and Health (O.S.H.A.) standards

1.2.2.7 USAF Fitness Facilities Design Guide dated October 1999

Available at: www.afcee.brooks.af.mil/dc/dcd/arch/fitness/siteoutline.html

1.2.2.8 ALUMINUM ASSOCIATION (AA)

AA DAF-45 (1997) Designation System for Aluminum Finishes

1.2.2.9 AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 101 (1997) Voluntary Specifications for Aluminum, Vinyl (PVC)
and Wood Windows and Glass Doors

1.2.2.10 TILE COUNCIL OF AMERICA (TCA)

1.3 DESIRED IMAGE AND ARCHITECTURAL COMPATIBILITY

The Proposer shall verify all drawings and provided information of conditions and dimensions during design and prior to construction.

The building shall fit the site and be compatible with the existing Dormitory's facility located to the east of this site. Building facades

and elevations shall be similar in appearance to the enclosed elevation drawings.

1.4 THE TYPE OF ACTIVITIES AND EQUIPMENT INVOLVED

The major functional activities of building are as follows:

Lobby space with juice bar and lounge/waiting area and elevator, and control counter. An administrative area will need to provide space for three offices, break room, storage and laundry area with folding tables and supply storage areas. A gymnasium to provide for a main basketball court and two smaller courts, two volleyball courts, and spectating seating the gym area will include a 4 lane running track above the gym floor along the perimeter, four racquetball courts with full glass back walls, six lane lap pool, three group exercise areas having movable partitions between them to allow for flexibility of size of these rooms. Public men's and women's toilets, locker rooms toilets and showers areas, distinguish visitor locker rooms and shower areas, storage rooms. HAWC area to include a reception/lobby area, office spaces, classroom, computer library, Ergometry stations, wellness assessment rooms, resource library, food demonstration area Men' and Women's toilet, janitor closet, and storage area. Cardiovascular workout room located on the second floor. Mechanical, electrical and communications spaces.

Lap Pool area shall be constructed with 6 lanes that are 45 feet wide by 75 feet long. Pool shall be deep enough to allow for water aerobics. All finishes within this area shall be slip and moisture resistant type.

Running track shall be designed to not interfere with other building functions. Be a minimum of four lanes that are 4-foot wide and have an inside radius of 8 foot and an outside radius of 20 foot.

1.5 TYPE AND METHOD OF CONSTRUCTION

1.5.1 Facility Construction

Facility shall be designed as permanent construction. The definition of permanent construction per MIL HDBK 1190: Buildings and facilities designed and constructed to serve a life expectancy of more than 25 years, should be energy efficient, and must have finishes, materials, and systems selected for low maintenance, recycled materials, and low life-cycle cost.

Types and methods of construction limited to the criteria established herein and shall meet all governing codes.

Wood construction shall not be permitted.

Any concrete masonry units walls used in this buildings shall be developed on a standard masonry module. Standardization of masonry wall design shall be developed which result in as few cut blocks as possible. Masonry structural properties shall comply with requirements outlined in Section 01005 STRUCTURAL REQUIREMENTS.

Walls, windows, floors, and roofing systems shall be permanently constructed and attached to each other. All construction shall be done in a workman like manner, properly installed and finished.

Methods, materials, systems, etc. shall be of a quality that requires little or no maintenance.

1.5.2 Exterior Walls and Finish Materials

Exterior walls and finish materials shall be selected on the basis of architectural compatibility and appearance in accordance with the design provided. The exterior features of this facility shall reflect the functional areas of the interior spaces. The outside face of the exterior walls shall be composed of split-face concrete masonry and burnished double half units (as indicated on the drawings). Exterior walls shall have a minimum "U" Value of .07 based on aged insulation values for the entire exterior wall construction.

1.5.3 Interior Wall Construction

All interior walls shall be permanent construction.

Gypsum wallboard shall not be less than 5/8-inches thick.

Steel studs shall be sized according to the wall heights required. Studs for the racquetball courts shall have a minimum uncoated design thickness of 0.0451 inch and a minimum depth of 6-inches. Studs for the racquetball court walls shall be spaced at a maximum distance of 16-inches on center for side walls and 12-inches on center for front walls.

Interior walls requiring fire ratings or other walls extending to the underside of the roof structure shall be designed and constructed in accordance with UL and approved tested systems. These walls shall also have provisions for structural deflection of the roof structure above.

Gymnasium walls shall be full height, durable for high use, and provide sound reducing capabilities located as indicated on the floor plan .

1.5.4 Interior Wall Finishes

Interior wall finishes shall be high quality, low maintenance finishes suitable for the environment of this building.

All areas generally shall receive a painted finish except as described herein.

Toilet rooms and locker rooms shall receive ceramic tile wainscot to a minimum of 4-foot above the finish flooring with painted gypsum wallboard above. Showers and drying areas shall have full height ceramic type walls. The walls shall be set using a Dry-Set mortar method in accordance with the Tile Council of America.

Walls for the racquetball courts shall be constructed of plastic laminate panels typically used in court construction with the rear wall area consisting of full height shatter proof type glass.

Office areas shall have painted gypsum wallboard type walls.

See paint paragraph for painting systems requirements.

Walls with ceramic tile finishes on steel stud partitions shall have concrete backer board as a substrate for tile.

1.5.5 Floors

All interior floors shall be concrete slabs on grade for the first floor with concrete slabs over steel structure for the second floor.

Depressed floor slabs and mortar bed method shall be used for all floors that will receive porcelain tile in accordance with Tile Council of America (TCA) methods.

1.5.6 Floor Finishes

Flooring for this facility shall consist of the following finishes:

Porcelain tile shall be installed in toilet rooms, locker rooms, showers, and janitor closets, and shall be set in a cement mortar bed. Tile floors in all rooms shall be level except in the immediate areas around floor drains which shall be sloped. Shower areas shall have the floor slope to allow moisture to migrate to floor drains.

Vestibules shall receive porcelain tile floor on the floor set in a cement mortar bed.

Lobby area will consist of carpet with accent of porcelain type. Porcelain type flooring shall be provided at all drinking fountains locations.

Gymnasium floor, small and large aerobic group exercise rooms, and racquetball court floors shall receive a maple tongue and groove maple flooring specially manufactured for these types of areas. Floors for the gymnasium, group exercise rooms and racquetball courts shall be sealed and finished in accordance with standard practice of the manufacturers of such floors. Lines to identify basketball, volley ball, and racquetball courts shall be a minimum of 2-inches in width and layout as indicated on the drawings. Each court markings shall be identified by both a different line type and color.

Synthetic sports type flooring specifically manufactured for the respective areas shall be used in the Cardiovascular room, Weight room, and on the indoor track.

Carpeting shall be used in office areas, corridors, Hawc areas as indicated on the drawings.

Juice bar area, adjacent to the control counter, and at drinking fountain locations shall have a porcelain tile flooring installed to help in the maintenance of these areas.

The mechanical, electrical, communications, areas shall have exposed concrete slabs and shall be cleaned and sealed with a concrete hardener for durability and minimization of dust.

1.5.7 Ceiling Finishes

Textured gypsum board ceilings shall be finished in toilet areas, locker rooms, laundry room, equipment repair, janitor closets, and shall be painted.

Acoustical tile ceiling panels shall be at least 3/4-inch thick mineral fiber material installed in spaces indicated on the drawings.

Ceiling in the Racquetball areas will consist of a plastic laminated type panel typically used for this type of area.

It will be acceptable for gymnasium, lobby area main corridor, mechanical, electrical, and communication equipment rooms to have exposed structures that do not require any finished ceilings. However, exposed structural elements in these areas will require painting or a spray-applied fireproofing depending on structural design and compliance with applicable building and fire safety code requirements.

1.5.8 Ceiling Height

Minimum allowable clearance for ceilings shall be as indicated on the drawings, the contractor can exceed these minimum as need to allow for a more functional area. Gymnasium area of this facility will require a minimum clear open area of 24-foot from the finish floor to any structure, mechanical and electrical equipment, or any obstructions. Lobby area and corridors adjacent shall be designed as indicated. Racquetball courts shall have a minimum clear ceiling height of 20-foot from the finish floor to the ceiling. Minimum ceiling requirements are listed on the drawings for the remaining areas.

1.6 FUNCTIONAL REQUIREMENTS

1.6.1 Equipment and Furnishings

1.6.1.1 Contractor Furnished and Contractor Installed Equipment

Contractor Furnished and Contractor Installed equipment within this facility shall include all items but not limited to the following:

Toilet accessories

Fire extinguisher cabinets with fire extinguishers size to fit cabinets

Casework including control counter with under counter storage for equipment, storage cabinets, drawers, and computer equipment, all storage areas in public areas shall be provided with locks including drawers, cabinets, and storage areas in the juice bar area and control counter area. Personnel doors (Standard, fire rated, and insulated)

Mop sink

Laundry sink

Lockers full height metal with upper storage area and hanger capabilities

Volley ball poles and netting, recessed floor mounting of poles, and padding

Information board located near control counter

Key storage cabinet

Basketball baskets and back boards shall be electrically operated fold up type of units. Back boards shall be shatter proof type glass for all court boards

Fifteen television mounting brackets mounted in the ceiling fourteen located in the cardiovascular room and one in the HAWC area.

Six shot clocks

Two Sauna rooms

Gym Divider

Wood lockers in D.V. locker areas number as indicated on the drawings

Mirrors

Diaper changing stations (in public toilets.)

Electric water coolers

Saunas

Wally ball brackets and net for two of the Racquetball courts

1.6.2 Occupational Safety and Health

Building design shall comply with OSHA Occupational Safety and Health Standards criteria for all items which must be included in the design to ensure safety compliance.

1.6.3 Handicapped Accessibility

The building shall comply with handicap accessibility requirements as outlined in the American With Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities.

1.6.4 Sound and Vibration Control

Standard materials and installation procedures shall be incorporated into the facility that reduce sound and vibration. When constructing walls, floors, ceilings, and roofs, materials shall be selected that will impede transmission of equipment vibrations and noise between rooms and within rooms. All interior walls shall extend up to the underside of structure, or be capped above the ceiling with sound blankets installed on each side of the wall above the ceiling to limit sound transmission from one space to another. Walls enclosing the gymnasium shall be constructed similar to STC 45 rated construction. Walls enclosing the small and large group exercise shall be constructed similar to STC 50 construction. Walls enclosing the Health and Wellness Center (HAWC) shall be constructed similar to 50 STC rated construction, with rooms within the area shall be constructed similar to 45 STC between interior spaces. The intent of the STC rating is to provide for a more sound efficient wall system in certain loud areas without increasing the cost of the construction, therefore the sealing and testing requirements for the walls defined in this paragraph shall be waved.

1.6.5 Physical Security

Conventional security measures, such as: door locking hardware, shall be incorporated into the facility design and development. See specific paragraphs in this section for additional security criteria.

1.6.6 Composition of Masses and Spaces and Architectural Details to Reflect the Desired Image, and the Scale and Nature of the Activities Involved

Features of scale such as horizontal banding, and changes in texture shall be used to tie the building together with the ground line. Materials selected shall be compatible with "commercial" construction. Building elevations shall similar to the existing Aerobics facility located to the east of this project site for color and material selection, and shall be approved by the Base.

1.6.7 Economy of Building Construction, Operation, and Maintenance:

Life-Cycle Cost Effectiveness

1.6.7.1 Economy

All materials shall be readily available within the local area, as shall sufficient trades to construct the building.

No special or unique forms of construction shall be used and skilled workers within the area shall be familiar with the proper methods required to build this facility.

1.6.7.2 Operations and Maintenance

Material selections shall be based upon reducing operation and maintenance costs. All materials shall be easy to clean and resist soiling.

1.7 TECHNICAL REQUIREMENTS

1.7.1 Miscellaneous Metals

1.7.1.1 Access Doors and Panels

Access doors and panels shall be flush type. Frames for access doors shall be fabricated of not lighter than 16 gauge steel with welded joints and finished with anchorage for securing into construction. Access doors shall be a minimum of 14-inches by 20-inches and of not lighter than 14 gauge steel, with stiffened edges, complete with attachments. Access doors shall be hinged to frame and provided with a flush face and a keyed operated latch. Exposed metal surfaces shall have a shop applied prime coat. Finished paint coat shall match surrounding surfaces. Panel shall be installed in uninhabitable rooms (i.e., closets) and/or non-conspicuous locations.

1.7.1.1 Louvers, Dampers, and Ductwork

Detailing and construction of louvers, motorized dampers, and ductwork shall be coordinated. Louvers shall be installed high on the wall to meet the criteria established by Force Protection Construction Standards.

1.7.1.2 Miscellaneous

Detailing and construction of louvers, motorized dampers, and ductwork shall be coordinated.

1.7.2 Roof Insulation

Roofing insulation shall be a polyisocyanurate type. A minimum aged "R" value of the roofing insulation shall be R-33, based upon a R-5.56 per 1-inch of thickness. Therefore, the total roofing insulation thickness shall be a minimum 6-inches.

A single ply vapor barrier shall be installed between the roofing deck and the bottom of the roofing insulation. The thickness of the vapor barrier shall be in accordance with the roofing system standard thickness.

1.7.3 Roof Design

1.7.3.1 Built-up Roofing System

Part of the facility shall consist of a built-up type of roof. The critical aspects of the roofing system shall be appearance, and minimal maintenance.

Roof slopes shall be a minimum of 1/2-inch per foot.

Primary roof slope shall be accomplished by sloping of the structural roof framing members to interior roof type of drainage system that will be connected into the storm sewer system.

Roof system shall provide a 20 year minimum warranty.

Roof system shall include a vapor retarder membrane.

Lightning protection shall be fully integrated and coordinated with the roofing detailing, and installation to not jeopardize in any way the roof warranty.

Roof drains and overflow drains shall be interior type drainage system that will be connected into the storm sewer system. Overflow drains shall be a complete separate system from the roof drain system.

1.7.3.2 Standing Seam Metal Roofing (SSMR)

Part of the roof shall consist of standing seam metal roof. The roofing color shall match the existing roof color of the Aerobics facility.

Minimum roof slopes shall be as indicated on the drawings.

Primary roof slope shall be accomplished by sloping of the structural roof framing members to a gutter and downspout drainage system that will be connected into the storm sewer system.

Roof system shall provide a 20 year minimum warranty.

Roof system shall include a vapor retarder membrane.

1.7.4 Sheet Metalwork, General

Contractor shall include a quality assurance plan which includes a checklist of points to be observed, prior to start of roofing work.

All interior cavity thru-wall flashing shall be a metal type. A non-metal elastomeric ply sheeting is not considered to be acceptable.

Fascia shall have "V" crimps and a stable substrate as required to prevent "oil-canning" effect.

1.7.5 Doors

a. Exterior doors shall be heavy duty flush steel type of doors minimum of 16 gauge face sheets with 16 gauge pressed steel frames, shall be weather tight, and insulated to meet an R-value of 10. Steel door frames shall have a thermal break to prevent temperature transferring. These doors shall be complete door and frame assemblies with weatherstripping, door bottoms, and threshold. All exit door locations shall have exit device with delayed alarm type exits.

- b. All exterior doors open on to a structural concrete landing or stoop and shall conform to NFPA #101 for floor slope at the door.
- c. Doors in fire rated walls shall be fire rated according to the fire rating requirements of the walls in which they occur. All fire doors shall be in accordance with the requirements of NFPA #101 and NFPA 80.
- d. Main entrance doors shall be incorporated into the window wall system as indicated on the elevations.
- e. Interior doors shall be mainly constructed of solid core wood consisting of premium grade red oak with pressed steel frames. Entrance doors into the lap pool area shall consist of Aluminum and glass store front type of doors and frames. Doors and windows within the pool area shall be specifically made for a pool environment to help eliminate aluminum from oxidizing. Fire rated doors shall be rated according to the fire rating requirements of the walls in which they occur. All fire doors shall be in accordance with the requirements of NFPA #101.

1.7.6 Hardware; Builder's (General Purpose)

1.7.6.1 Hinges

All hinges shall be grade I anti-friction bearing with a minimum of 3 hinges per door leaf. Hinges shall be fully recessed and fit flush within designated frame slots.

1.7.6.2 Locks and Latchsets

All exterior and interior door locks and latchsets shall be series 1000 mortised type.

1.7.6.3 Lock Cylinders

Lock cylinders shall not be less than seven pins.

Cylinder shall have key removable type cores. Disassembly of knobs, lever and locksets shall not be required to remove core from lockset.

Provide a minimum of 5 spare cores, 2 blank master key sets and 10 blank keys.

1.7.6.4 Lock Trim

The doors of these facilities shall have lever handles with all exterior doors having panic type hardware.

1.7.7 Keying

Locks and special key hardware shall be keyed to the Buckley Air Force Base master key system or equal compatible lock system with interchangeable cores.

A grand master keying system shall be provided for the building. All of the keys shall be keyed in one series, except the mechanical, electrical and communication equipment rooms.

Locks for all mechanical, electrical, and communications equipment rooms shall be keyed to the existing Base utility keying system.

1.7.8 Door Closing Devices

Surface type overhead door closures shall be Grade 1, Series CO2000 Standard Cover. Closures shall be size VI.

1.7.9 Auxiliary Hardware

Door floor stop and holder shall be Type L01371.

Door wall stops shall be Type L02251.

Lever extension flush bolts shall be type L04081.

Metal thresholds shall be Type J16130.

All exterior doors shall have aluminum housed type weather seals.

All rated doors shall have compression type seal gasketing.

1.7.10 Finishes

Door hardware finish shall match satin stainless steel Type 630.

1.7.11 Door Hardware

1.7.11.1 Hardware Requirements

Door hardware in fire rated walls shall comply with NFPA and other applicable criteria.

1.7.11.2 Hardware Sets

The following hardware sets listed are the minimum functional hardware requirements for each door types. Additional hardware may be required for each door type than listed below.

a. Exterior Steel Doors

(1) All single exterior personnel doors shall have the minimum following hardware features additional hardware shall be supplied to provide for a complete installation:

Grade 1 Hinges

Exit Device Type 3, Mortise Device
Overhead Closer
Wall or Floor stops
Weatherstripping
Threshold

(2) All double exterior personnel doors shall have the following hardware features:

Grade 1 Hinges
Surface Vertical Rod Exit Devices
Overhead Closer (Both leafs)
Wall or Floor stops
Weatherstripping

Threshold

All exterior doors from public spaces to the exterior with the exception of the main entrance shall have delayed egress locks provided.

(3) All double exterior mechanical, communications, and electrical room doors shall have the following hardware features:

Grade 1 Hinges

Mortise Lockset Hardware (Key locking capabilities on active leaf)

Overhead Closer (Active leaf)

Lever Extension Flush Bolts (Inactive leaf)

Weatherstripping

Thresholds

b. Interior Doors

All single doors used in offices, janitor's closets, storage rooms, shall have the following hardware features:

Grade 1 Hinges

Mortise Lockset (Key locking capabilities - avoid self locking hardware.)

Overhead Closer

Wall or floor Stops (Provide holder where appropriate)

1.7.12 Key Storage System

A recessed wall mounted key cabinet shall be provided in the control counter area, and contain all additional keys for all areas of the building. Cabinet shall have the capacity to store a minimum of two keys for each room on an individual key hook. Key hooks shall be mounted on panels with sufficient distance between hooks that will allow easy identification and removal. Cabinet key panels shall be readily removable and capable to insert additional panels for expansion needs. Key cabinet shall have key locking capabilities. Cabinet door shall be a full height piano hinge.

1.7.13 Graphic Annunciator Panel

In Vestibule #101 provide a graphic annunciator panel. The panel shall have a graphic plan of the building with indicator lights defining the areas with activated fire alarms. To allow access to the annunciator panel the exterior doors of the vestibule shall remain unlocked and only the interior door of the vestibule will be locked for security.

1.7.14 Aluminum Windows

Window manufacturer shall specialize in designing and manufacturing the type of aluminum windows specified in this section, and shall have a minimum of 10 years of documented successful experience. Exposed surfaces of aluminum windows shall be finished with anodic coating conforming to AA DAF-45: Architectural Class I, AA-M10-C22-A44, color anodic coating, 0.7 mil or thicker

Windows construction shall consist of an aluminum frame with a continuous thermal break. Performance rating of these windows shall be a HC 65 or greater in accordance with performance rating testing with AAMA 101. These windows shall include insulated glazing unit as specified in Section 08810a GLASS AND GLAZING. Window frames shall have a color anodized finish.

1.7.15 Glass and Glazing

1.7.15.1 Insulated Laminated Glass

Insulated laminated type glass for door applications shall be a minimum of 1-inch thick. Glass panel shall consist of two-1/4-inch glass panes separated by a 1/2-inch air space and hermetically sealed. Glass shall be Type I annealed glass, Class 1- clear, Quality q3- glazing select. All insulated glazing units shall be tinted with the reflective coating applied to the number two surface.

1.7.15.2 Skylight Structure

Skylights shall be designed and manufactured by a supplier who's only business is designing and installing skylight structures, and who has a minimum of 10 years of documented experience in the type of structure proposed in this document. Exposed surfaces of the frame shall be finished with an anodic coating Architectural Class I, AA-M10-c22-A44, 7 mil or thicker. This structure shall include insulated glazing unit as specified in Section 08810a GLASS AND GLAZING, and as specified below. The structure shall meet the requirements of Force Protection Construction Standards.

1.7.15.3 Glass Mirrors

All glass mirrors shall be Type I transparent flat type, Class 1-clear and 6.4 inches thickness.

1.7.15.4 Laminate Glass

Laminated glass shall be Class 1- clear, Condition A uncoated surface, Quality q3- glazing select. Laminate glass shall consist of two layers of Type I transparent heat strengthen glass bonded together with a PVB plastic inter layer.

1.7.16 Gypsum Wallboard

Manufacturer shall have specialized in the manufacturing of these material products for a minimum of 10 years of documented experience.

Installer shall have a minimum of 5 years of documented experience.

All gypsum wall board shall be a minimum of 5/8-inch thick.

All metal studs shall be placed at a maximum distance 16-inches on-center.

Predecorated gypsum board is not considered acceptable.

Exterior gypsum soffit board is not considered acceptable.

Water-resistant gypsum backing board used as a substrate to receive ceramic tile is not considered acceptable.

1.7.17 Tile

Floor tile in toilets shall be installed in accordance with Tile Council of America (TCA) method F121.

Wall tile in toilets, locker rooms, and shower areas shall be installed in accordance with Tile Council of America (TCA) method W244.

1.7.18 Ceilings

1.7.18.1 Gypsum Board Ceiling

All gypsum board ceilings shall have a light textured finish.

1.7.18.2 Acoustical Tile Ceiling

Acoustical ceiling system shall be a 24-inch X 24-inch exposed grid type. Acoustical panels shall have a square edge and recessed where the exposed grid system supports the panels. Characteristics of the acoustical panels shall consist of: textured surface, high density material to resist impact damage, non perforated tile with a textured finish.

1.7.19 Painting, General

1.7.19.1 Surfaces to Receive Stain or Paint

A semi-gloss enamel paint shall be on all exposed wall surfaces, except mechanical, electrical and communication rooms. A high-gloss enamel paint shall be used on all janitor closets walls.

All gypsum board ceilings shall receive a flat latex paint finish.

Exposed masonry walls to be painted shall receive a latex filler coat prior to paint application.

Steel roof deck, structural elements, shall receive a semi-gloss paint finish.

1.7.19.2 Surfaces Not to be Painted

Surfaces in the following areas are not to be painted:

Concrete or concrete masonry units in unexposed areas.

Concrete and concrete masonry units surfaces in mechanical, electrical and communication rooms.

Concrete floors - except where noted.

Metal surfaces of aluminum, stainless steel, chromium plate, bronze, copper and similar finish materials.

Jacketing over pipe insulation in unexposed locations that do not require color coding.

Surfaces of hardware, fittings, sprinkler heads, fire protection equipment and other factory finished items not requiring a painted finish.

Glass, wall covering and other finish surfaces.

1.7.20 Exterior Signage

Building number Signage shall be cast aluminum material in a helvetica medium style, located as directed.

Building number Signage shall be eight inches tall, satin-finished brushed aluminum.

1.7.21 Toilet Accessories

1.7.21.1 Accessory Types

Janitor closets shall have a 18 gauge stainless steel, satin finish shelf integral 4 mop holder and 5 hook brackets shall be supplied.

Electric Hand Dryer (EHD) shall be a semi recessed mounted dryer. Features of the dryer shall include a: 360 degree rotating nozzle, minimum 1/10 hp motor, push button motor switch. Dryer casing, nozzle and push button shall have a chrome plate steel finish.

Toilet partitions shall consist of polymer resins or solid surface type materials. Toilet partitions shall be floor mounted with overhead bracing.

Paper Towel Dispenser/ Waste Receptacle (PTDWR) shall be a recessed unit supplying multi-fold paper towels. The cabinet shall have a concealed tumbler key lock. Unit shall have a 2 cu.foot minimum removable molded plastic insert.

Soap Dispenser (SD) shall be the liquid type pump type with a minimum 34 fluid ounce capacity. Dispenser shall be mounted on the lavatory fixture.

Mirror Glass(MG) mirrors shall be a minimum of 16-inches wide by 24-inches deep and shall be installed over the lavatory as indicated on the drawings. Two mirrors shall be installed in each locker room with one full length type mirror included in each locker room.

Toilet Tissue Dispenser (TTD) shall be a double roll dispenser with a recessed holder.

Sanitary Napkin Dispenser (SND) shall be wall mounted and mounted where indicated on the drawings.

Grab Bars (GB) Shall be 1-1/4-inch in diameter, 304 stainless steel, concealed mounting, and non slip finish.

Shower Curtain (SC) Shower curtain shall be sized to suit conditions and shall be anti- bacterial nylon/vinyl fabric.

Shower Curtain Rods (SCR) Shall be type 304 stainless steel a minimum of 1-1/4-inch in diameter.

Soap Holder (SH) Soap holder shall be recessed type constructed with type 304 stainless steel.

Towel Pin (TP) shall be stainless steel concealed wall fastening with the pin integral with the wall flange. Design of towel pins shall be consistent with the design of other accessory items.

Toilet Seat Cover Dispenser (TSCD) Dispensers shall be Type 304 stainless

steel and shall be recessed mounted with a minimum capacity of 500 seat covers.

In locker room, provide vanities with mirrors and electrical outlets.

1.7.21.2 Toilet Accessory Finishes

Finishes shall match stainless steel, Type 304.

1.7.22 Fire Extinguisher Cabinets

Fire extinguisher cabinets shall be fully recessed type with a flat metal door. Clear plastic bubble type door fronts is acceptable. Fire extinguisher cabinets shall be located in accordance with NFPA Life Safety Code #101.

1.7.23 Miscellaneous

Provide six ceiling mounted television shelves in the Cardiovascular Room. Provide one ceiling mounted television bracket in the waiting area of the HAWC area

1.7.24 Display Case

A minimum of two pre-manufactured display case shall be provided that opens into the Lobby #102. The display case shall be minimum dimensions of 18-foot long X 6-foot tall X 1-foot deep. The unit shall be the product of a manufacturer who specializes in the construction of display cases.

1.7.25 Janitor's Closet Accessories

Each janitor's closet shall have a broom/ mop rack, storage shelving, and mop sink.

1.8 ROOM DESCRIPTIONS

1.8.1 Entrance Vestibule #101,

A recessed floor mat shall be set in the concrete floor. The north and south walls shall be constructed of glass glazing set in aluminum frames.

Insulated glass shall meet the requirements of Force Protection Construction Standards and meet energy efficient coefficient established in this section. The graphic annunciator panel shall be located in the west wall.

1.8.2 Entrance Vestibule

A recessed floor mat shall be set in the concrete floor. Entrance doors and frames shall be aluminum type with 1/4-inch glazing. Walls shall be covered with 5/8-inch gypsum wallboard.

1.8.3 Lobby #102

The exterior wall shall be masonry with gypsum wallboard on the interior sides and 1-inch insulated windows. All windows shall have laminated glass and reinforced framing to meet Force Protection Construction Standards. Two factory finished trophy cases shall be provided with lockable sliding

glass doors. Provide one information board a minimum of 6-foot long by 4-foot high with lockable glass front door. Floor shall be constructed of reinforced concrete and finished with carpet and porcelain tile, contractor to provide texture, patterns, and accent colors.

1.8.4 Control Counter #188

Counter tops shall be solid surface material. Base cabinets shall include open shelves for storage of towels, and closed lockable units for storage of sports equipment. Drawers and lockable doors shall be provided. Space shall be provided for basketball storage racks, and a cash register. Provide one door pull per drawer or door. Use adjustable shelving where possible. Provide task lighting in the counter to light the work surface. Provide space for two computers, computer key board, and mouse pad within the counter. The front of the counter shall be covered with a sheet of solid material similar to the counter top material and integrally colored split-face concrete masonry as indicated on the drawings.

Lighting of the control counter casework shall require task lighting, and accent lighting. Lights in the counter shall illuminate the work surface. Accent lighting of the counter by pendent lights suspended from above (minimum of four pendent lights)

1.8.5 Juice Bar #103

Counter top shall be solid surface material to match what is supplied for the control counter. A base cabinet with lockable doors and adjustable shelving shall be provided. The counter shall match the material of control counter #188. Provide rough-in for the refrigerator and ice maker.

1.8.6 Laundry/Storage #185

Room shall have moisture resistant paint system. Hollow metal doors shall be provided. Hook-ups of two commercial washers and two commercial dryers shall be provided. A folding area with storage below and clean towel storage shelving shall be located as indicated on the drawings. Provide storage cabinets above the washers and dryers. The room is for repair and temporary storage of exercise equipment. Counter tops shall be plastic laminate with a integral backsplash. Base cabinets shall have adjustable shelves, without drawers. Base cabinet doors shall be lockable.

1.8.7 Free Weights & Resistance Weights #139

Floor shall have synthetic sports flooring. The ceiling shall be exposed to the underside of metal decking and 5/8" gypsum wallboard at soffits and other locations that maybe required, spray-on fire proofing shall not be used to protect the structure in this location. Provide suspended sound baffles in the space above to reduce flutter echo within the rooms. Walls along the south shall be covered with mirrors, starting at a bottom elevation of 18-inches and a top elevation of 6-foot above the finish floor.

1.8.8 Group Exercise Areas #105,106,&107

Floor shall have maple sports flooring. The ceiling shall be acoustical tile type ceiling with 5/8" gypsum wallboard painted soffits and accent locations, spray-on fire proofing shall not be used to protect the structure in this location. The south walls, west wall of #107, and east wall of room 105 is to be covered with mirrors, starting at a bottom elevation of 18-inches above the finish floor , and have a top elevation of

6-foot above the finished floor. Provide in room107 a base cabinet with lockable doors with adjustable shelves, and a plastic laminate counter top. Above the base cabinet there shall be open adjustable shelves the are enclosed by lockable clear swinging glass doors. The shelves above the base cabinet shall be used to store sound equipment for the group exercise rooms. The cabinet shall be designed large enough to house the sound equipment for all three exercise rooms.

1.8.9 Gymnasium #141

Provide maple sports flooring for the entire room with painted lines defining the basketball courts and volley ball courts. The maple sports flooring shall be shock absorbing system similar to an "Aacerflex" system manufactured by Aacer Flooring, LLC, Peshtigo, Wi., "Neoshock" performance system manufactured by Connor Sports Flooring, Arlington Heights, Il. All basketball backboards shall be retractable. Two score boards shall be provided with remote controls and six shot clocks shall be provided in the gymnasium. A ceiling mounted vinyl mesh separation net shall be provided between the two basketball courts. The separation screen shall be mounted with an operating system that lifts and lowers the screen from the floor to the ceiling above. Provide retractable bleachers to hold five hundred people within the gymnasium.

1.8.10 Cardiovascular Equipment #107

Floor shall have synthetic sports type flooring with the base providing synthetic sport mats to be located at each piece of equipment. The ceiling shall be acoustical tile type ceilings with painted 5/8-inch gypsum wallboard at soffit and other required locations, spray-on fire proofing shall not be used to protect the structure in this location. Provide suspended sound baffles in the space above to reduce flutter echo within the room. Provide six ceiling mounted T.V. brackets, coordinate the location of these mounting brackets with the equipment layout.

1.8.11 Racquetball Courts #147,148,149,&150

Floor shall be maple sports flooring. Walls shall be plastic laminated tongue and grooved panels typically used for this type of room south wall shall be constructed of tempered or laminated glass, see room finish schedule. Pre-manufactured racquet ball court kits should be considered. Racquet ball courts shall meet all the criteria of the International Racquet Ball Association.

1.8.12 V.I.P. Locker Room #153 & 181

Provide full height wood lockers, there shall be a minimum 28 lockers in #153, and 9 lockers in #181. Provide wood benches and solid surface material for the counter tops, backsplash and toilet partitions. Base cabinets shall be mounted and designed for access by the physically handicapped. Fronts of these cabinets shall have removable panels to allow access to piping under the sink. Provide all necessary grab bars with ceilings being constructed for moisture resistant.

1.8.13 Men's Locker Room #159, Women's Locker Room #176

Provide 1-foot by 1'-6" by 72' full height metal lockers, minimum 173 lockers in #159 and 150 lockers in #176. Provide wood benches and solid surface material for the counter tops, backsplash and toilet partitions. Base cabinets shall be mounted and designed for access by the physically

handicapped. Fronts of these cabinets shall have removable panels to allow access to piping under the sink. Provide all necessary grab bars with ceilings being constructed for moisture resistant. See Section 01006 Mechanical Requirements for the design of sauna. Provide exhausts or other means to control humidity within the spaces.

1.8.14 Men's Showers #165

Provide full mortar bed porcelain tile floor. Provide full height ceramic tile on all walls. Provide two handicapped showers with all grab bars and folding shower seat. Ceilings shall be moisture resistant. Provide shower curtain rods and shower curtains at both the shower area and at dry off area of the handicapped shower.

1.8.15 Men's Dry off Area #162

Provide full mortar bed porcelain tile floor. Provide full height ceramic tile on all walls. Provide towel hooks evenly space along all walls. Ceilings shall be moisture resistant.

1.8.16 Men's Toilet and Lavatory Area #161

Provide full mortar bed porcelain tile floor. Provide solid surface toilet partitions. Provide solid surface material for the counter tops and backsplash. Base cabinets shall be mounted and designed for access by the physically handicapped. Fronts of these cabinets shall have removable panels to allow access to piping under the sink. Ceilings shall be moisture resistant.

1.8.17 Women's Showers #175

Provide full mortar bed porcelain tile flooring. Provide full height ceramic tile on all walls. Provide handicapped grab bars and a folding seat in all handicapped shower stalls. Provide shower curtains at both the shower area and dry off area. Provide a minimum of two towel/clothes hooks in each area. Ceilings shall be moisture resistant.

1.8.18 Women's Toilet and Lavatory Area #177

Provide full mortar bed porcelain tile floor. Provide solid surface toilet partitions. Provide solid surface material for the counter tops and backsplash. Base cabinets shall be mounted and designed for access by the physically handicapped. Fronts of these cabinets shall have removable panels to allow access to piping under the sink. Ceilings shall be moisture resistant.

1.8.19 Janitor's Closets #110

Provide full mortar bed porcelain tile floor. Provide mop rack, storage shelving, and mop sink. Provide floor drain in the room.

1.8.20 Public Men's Toilet #155, and Women's Toilet #179

Provide full mortar bed porcelain tile flooring and ceramic tile wainscot on wall with painted gypsum wallboard above. Provide solid surface toilet partitions. Provide solid surface material for the counter tops and backsplash. Base cabinets shall be mounted and designed for access by the physically handicapped. Fronts of these cabinets shall have removable panels to allow access to piping under the sink. Provide a location for

diaper changing area built in to the counter tops. Ceilings shall be moisture resistant.

1.8.21 Kitchen Demonstration #135

Equipment for this space shall be residential, in nature. Equipment includes a range top with an in-counter exhaust system, (the exhaust shall run under the floor to a wall and up and out through the roof), dish washer, double sink with garbage disposal, hand washing sink double ovens and mounting location for a microwave. Equipment not in this contract, but should be considered in the design are a 25 cubic foot refrigerator and 21 cubic foot freezer, and shelf mounted microwave. The space above the cabinets and the ceiling shall be filled with a gypsum board soffit. The casework shall be designed to house an oven, sink, and dish washer. The base cabinets shall have lockable drawers and doors and have adjustable shelves. The island counter exhaust system that shall run under the floor and to the exterior through the roof. An exhaust hood above the counter will not be allowed. Supports to hold a slanted mirror above the range and food preparation surface shall be provided.

1.8.22 Class Room #136

A motorized screen shall be installed in the ceiling along the south wall of the room next to the movable partition centered along this wall, and be controlled from a wall switch located in the southeast corner of the room and a second switch located next to entrance door off of corridor 111. Fixed ceiling mounted projection support shall be provided as part of this contract. Projection equipment shall not be in contract. The folding doors between the Kitchen Demonstration #135 and the Class Room #136 shall be of insulated wall type panels that seal when in the closed position and shall be lockable.

1.8.23 Ergometry Testing Stations #113-120

Rooms shall be as indicated on the drawings with painted 5/8-inch gypsum wallboard walls. Provide one toe bar mounted near the floor along the South walls for each room. Ceilings shall be acoustical tile type

1.8.24 Computer Library #129

Computer room shall be sized as indicated on the drawings. Provide built-in book shelves along the north and east walls, book cases shall be a minimum of 6-foot above the finish floor. Provide a glass window on the west wall next to the door mounted a minimum of 42-inches above the finish floor. Ceiling for this area shall be acoustical tile type.

1.8.25 Library/Lounge area #127

Library and lounge area shall be sized as indicated on the drawings. Provide a half height wall between the Library area 127 and Reception area 126. This wall shall have a book case along the library side of this wall. Ceiling for this area shall be acoustical tile.

1.9 CASEWORK AND COUNTERTOPS

All casework construction shall meet the requirements of the National Kitchen Cabinet Association. Cabinets shall be provided as indicated on the drawings. Cabinets shall be standard or custom manufactured products.

Frame type units shall be provided. Top and bottom corners shall be braced with either hardwood blocks that are glued together with water resistant glue and nailed in place, or metal or plastic corner braces. All casework shall be constructed of solid wood or five-ply plywood. All points of hardware attachment shall be inserted into solid wood lumber. The finish of all exposed cabinet surfaces, and door shall be covered by plastic laminate unless otherwise directed by parts of this document. Countertops shall be solid surface material such as "Corian". The finish of the interior cabinets, shelving, and interior door surfaces shall be plastic laminate.

Drawers shall have side guides with under drawer supports and automatic stop feature. Sides and bottom shall be constructed of hardwood or plywood. Drawer fronts shall be removable and replaceable. All drawers shall be dove-jointed.

All exposed edges shall be rounded.

All cabinet pulls shall be recessed or U shaped, and meet the requirements of Americans with Disabilities Act. Doors shall have concealed hinges. Finishes shall match stainless steel, Type 304.

PART 2 NOT USED

PART 3 NOT USED

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SECTION 01004

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SECTION 01004

INTERIOR DESIGN REQUIREMENTS

PART 1 INTERIOR DESIGN REQUIREMENTS

1.1 REFERENCES

The publications listed below shall be utilized for design of this facility to the extent referenced. The publications shall comply with the latest edition of the UFGS guide specification (Copy included on CD-ROM).

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

AATCC TM 134	Test Method: Electrostatic Propensity of Carpets
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CODE OF FEDERAL REGULATIONS (CFR)

36 CFR 1191	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities
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AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 1335	Tuft Bind of Pile Floor Coverings Room Method
ASTM E 84	Surface Burning Characteristics of Building Materials
ASTM E 648	Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
ASTM F 793	Standard Classification of Wallcovering by Durability Characteristics
ASTM F 1066	Vinyl Composition Floor Tile
ASTM F 1344	Rubber Floor Tile

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A137.1	Ceramic Tile
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CODE OF FEDERAL REGULATIONS (CFR)

16 CFR 1630	Standard for the Surface Flammability of Carpet and Rugs
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DEPARTMENT OF AIR FORCE (AF)

AFPAM 32-1097	Air Force Sign Standards Pamphlet
AF FFDG	United States Air Force Fitness Facilities

Design Guide
www.afcee.brooks.af.mil/dc/dcd/arch/fitness/show.htm

FEDERAL SPECIFICATIONS (FS)

FS AA-V-00200

Venetian Blinds

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FED-STD 795

(Basic) Uniform Federal Accessibility
Standards

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)Org

NFPA 101

Life Safety Code

1.2 DESIGN CRITERIA

The design of this building shall be in accordance with this document.

1.3 INTERIOR FINISHES

1.3.1 Carpet

Preference should be given to carpet containing recovered material. Carpet tile with backing containing recovered carpet such as that offered by Collins and Aikman is recommended. Carpet shall be patterned or bold multi-colored tweed for maximum soil-hiding properties. A bold tweed must contain a minimum of two distinctly different colors, such as gray and burgundy. It shall be 100% continuous filament, solution dyed and/or yarn dyed, branded nylon with loop construction. Primary and secondary backing for broadloom carpet shall be synthetic. Provide larger scale patterns in larger areas as per paragraph 1.4.1. Carpet shall meet the following minimum requirements:

1.3.1.1 Pile Type

Pile type shall be loop with a minimum 1/12 gauge, minimum yarn weight of 20 ounces per square yard, and minimum pile density of 6000.

1.3.1.2 Static Control

Static electricity build-up of the carpet shall be permanently less than 3.5 kilovolts at 70 degrees F and 20 percent relative humidity as determined by the American Association of Textile Chemists and Colorists (AATCC TM 134 Test Method), Electrostatic Propensity of Carpets.

1.3.1.3 Flammability and Critical Radiant Flux Requirements

Carpet shall comply with 16 CFR 1630 and have a minimum average critical radiant flux of .45 watts per square centimeter when tested in accordance with ASTM E 648.

1.3.1.4 Tuft Bind

Tuft bind force required to pull a tuft or loop free from carpet backing shall be a minimum 10 pound average force for loop pile when tested in

accordance with ASTM D 1335. A ten year warranty from the carpet manufacturer against edge ravel, delamination and tuft bind is required.

1.3.1.5 Installation

Carpet shall be installed direct glue down. Adhesives and concrete primers shall be waterproof, nonflammable, meet local air-quality standards, and be as recommended by the carpet manufacturer.

1.3.2 Vinyl Composition Tile

Vinyl composition tile shall conform to ASTM F 1066, Class 2 (through pattern tile), Composition 1, asbestos-free. Tile shall have the color and pattern uniformly distributed throughout the thickness of the tile.

1.3.3 Raised Dot Rubber Flooring and Stair Treads

Rubber Flooring and Stair Treads shall conform to ASTM F 1344 Class 1 homogeneous construction, Type A. Surface shall be raised round studs with chamfered edges. Stud profile shall be low, and overall thickness shall be 1/8 inch. A one piece tread/riser design is required, including stringer angles on both the wall and banister sides and landing trim.

1.3.4 Rubber Sports Flooring

Flooring shall be textured surface, 1/2-inch thick rolled goods, equal to sports rubber flooring produced by "Tufflex" and "CSSI".

1.3.4 Ceramic Tile

Ceramic tile shall conform to ANSI A137.1, moderate to heavy grade only, and shall be provided in the pool area. Porcelain tile and trim shall be unglazed with the color extending uniformly through the body of the tile. Porcelain tile shall be equal to Crossville Ceramics. (Refer to paragraph 1.4.1. for pattern location.) Provide ceramic wall tile patterns with colors referenced in paragraph 1.4.1. Patterns shall be appropriate to size and shape of rooms. Light colors shall be used for background colors, and dark colors shall be used as accents. Provide recessed floor mats at all building entrances.

1.3.5 Interior Signage

Interior signage shall be included and must be coordinated with the user. Signage must conform to 36 CFR 1191 Americans with Disabilities Act (ADA) and FED-STD 795 Uniform Federal Accessibility Standards (UFAS), whichever is most stringent, and Air Force Sign Standards Pamphlet (<http://afpubs.hq.af.mil>). Include directional signage for wayfinding. Provide signage for all rooms unless otherwise directed by Contracting Officer. Coordinate signage requirements and placement with user and Contracting Officer.

1.3.6 Horizontal Blinds

Horizontal blinds shall be provided on exterior windows and interior windows excluding clerestory, store front, lobby and vestibules. Blinds shall be in accordance with FS AA-V-00200, Rev. B., Type II. Slats shall be aluminum and not less than .0070 thick.

1.3.7 Vinyl Wallcovering

Vinyl Wallcovering shall be vinyl coated woven or nonwoven fabric with germicidal additives and shall conform to ASTM F 793 Category V, Type II. Vinyl wall covering shall have a Class A flame spread rating of 0-25 and smoke development rating of 0-50 when tested in accordance with ASTM E 84. Provide wallcovering that is aesthetically pleasing and has some visual texture to simplify maintenance. Corner guards are required on outside corners that vinyl wallcovering is installed on.

1.3.8 Resilient Base

Resilient base shall conform to FS SS-W-40, Type I rubber or Type II vinyl. Style A, (straight)-installed with carpet. Style B (coved)-installed with resilient flooring. Base shall be 4 inches high and a minimum 1/8 thick. Job formed corners shall be furnished.

1.3.9 Installation of Finishes

All finishes shall be installed as per manufacturer's recommendations.

1.4 COLOR, TEXTURE, AND PATTERN

The color, texture, and pattern selections for the finishes of the buildings shall provide an aesthetically pleasing, comfortable, easily maintainable and functional environment for the occupants. Coordination of building colors and finishes is necessary for a cohesive design. Color of ceramic tile grout shall be a medium range color to help hide soiling. Plastic laminate shall have patterns that are mottled, flecked or speckled with a mar-resistant finish, such as Formica's "Crystal" finish. The Control Counter shall be constructed with high quality finishes such as solid surface material, granite, or wood.

1.4.1 Interior Finishes

Interior finishes shall be equal in appearance to the following:

Carpet in 102 Lobby/Waiting, 104 Corridor and 136 Classroom : Collins & Aikman "Odyssey", color 14507 Napa Valley.

Carpet in Offices and all other areas: Collins & Aikman "Infinity", color 55002 Napa Valley.

Porcelain Tile: Field - A233 Sand Bisque, Accents - A790 Burgundy Smoke and A410 Greenbriar. A floor pattern using all three colors shall be included in the design of 102 Lobby/Waiting, 104 Corridor, 103 Juice Bar and 188 Control Counter. The pattern in some of these areas may include carpet.

Ceramic Wall Tile: Field - (USCT) United States Ceramic Tile U-074, Accents - USCT U-729 True Teal, U-736 Burgundy, and U-759 Black. A wall pattern using the accent colors shall be included in the design.

Vinyl Wallcovering in Lobby/Waiting (including columns): National Wallcovering Tower Nava, color Bisque, T2-NV-06 (Attention must be given to place wallcovering in locations appropriate to height and scale of space.)

Vinyl Wallcovering in Offices 123, 124, 128, 174 and 187: MDC Wallcovering Hassan ISP 55412.

Plastic Laminates in Toilets: Countertops - Wilsonart 4761-90 Mystique Mount, Accent - Wilsonart 4662-90 Heather Legacy.

Plastic Laminates for Cabinetry in 103 Juice Bar and 188 Control Counter: Countertops - Wilsonart 4578-90 Mesa Blanca, Accents - Wilsonart 4617-90 Frience and 13007-90 Brune Crossweave. Note that plastic laminate references are used for color and pattern only; other materials such as

solid surfacing may be included in the design.

Any and all deviations or additions to the above design must be approved by the Corps of Engineers during the 60% and 100% submittal stages. Manufacturer's referenced are not intended to limit the selection of equal colors from other manufacturers.

1.4.2 Exterior Finishes

Masonry shall match Valley Block Co. Cinnamon Tan #174. Mortar shall match Threewitt-Cooper #32Q Golden Brown. Glazing shall match Viracon VS 5-08. Windows and storefronts shall match clear anodized aluminum. Roof shall match roof color of the existing Aerobics Facility. Where finish materials are different, they shall be compatible and coordinated with the Contracting Officer.

1.5 FURNITURE

1.6 Furniture Layout

Furniture layout will be functional and coordinate with the building design to assure that locations of electrical and communication outlets, and lighting within the building are appropriate. The layout will also be coordinated with other building features such as architectural elements, thermostats, lighting, location of TVs, etc. Furniture shall be located in front of windows only if the top of the item falls below the window. The furniture layout shall conform to requirements specified in 36 CFR 1191, FED-STD 795, and NFPA 101.

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SECTION 01005

STRUCTURAL REQUIREMENTS

PART 1 STRUCTURAL

1.1 PROJECT DESCRIPTION AND REQUIREMENTS

The Physical Fitness Center shall be a one story structure with floor, roof and exterior wall configurations as indicated on the attached architectural drawings. The building shall be structurally designed and configured by the Design/Build Contractor in accordance with the criteria and other requirements stated herein.

1.2 DESIGN CRITERIA

The design publications listed below shall be used as sources of criteria for structural design. The criteria from these sources may be supplemented, but not supplanted, by applicable criteria contained in nationally recognized codes, standards, and specifications. (In all cases, later editions to the below listed documents may be used.)

1.2.1 Department of the Air Force Technical Manuals (AFM)

(These manuals are available from the National Institute of Building Sciences Construction Criteria Base (CCB) (See Section 01332, SUBMITTALS DURING DESIGN for availability). Some of these manuals may be available to download in Acrobat .pdf file format at the following internet address: (<http://www.hnd.usace.army.mil/techinfo>.)

AFM 88-3 Chap. 3 Masonry Structural Design for Buildings (Oct 92)
(Army TM 5-809-3)

AFM 88-3 Chap. 15 Concrete Floor Slabs on Grade Subjected to Heavy Loads
(Aug 87) (Army TM 5-809-12)

1.2.2 US Army Corps of Engineers Technical Instructions (TI)
(Available at <http://www.usace.army.mil/usace-docs> and is listed under "Engineer Instructions".)

TI 809-02 Structural Design Criteria for Buildings (Sep 99)

TI 809-04 Seismic Design for Buildings (Dec 98)

TI 809-52 Commentary on Snow Loads (Aug 98)

1.2.3 American Society of Civil Engineers (ASCE) Publication

ASCE 7-98 Minimum Design Loads for Buildings and Other Structures

1.2.4 American Concrete Institute Publications

ACI 318-99 Building Code Requirements for Structural Concrete
and Commentary

ACI 530-92 Building Code Requirements for Masonry Structures and
Commentary

1.2.5 American Institute of Steel Construction Publication

Specification for Structural Steel Buildings - Allowable Stress Design,
Plastic Design (ASD) (June 1, 1989)

Load and Resistance Factor Design Specification for Structural Steel
Buildings (LRFD) (December 1, 1993)

1.2.6 Federal Emergency Management Agency Publications

(These publications can be obtained at no charge from:

FEMA Report Distribution Center
PO Box 2012
Jessup, MD 20794
Telephone: 800-480-2520; Fax: 301-497-6378)

FEMA 302 NEHRP Recommended Provisions for Seismic Regulations for New
Buildings and Other Structures : Part 1 - Provisions (February
1998)

FEMA 303 NEHRP Recommended Provisions for Seismic Regulations for New
Buildings and Other Structures : Part 2 - Commentary (February
1998)

1.2.7 Steel Deck Institute (SDI) Publications

Diaphragm Design Manual (2nd Edition, 1987)

Design Manual for Composite Decks, Form Decks and Roof Decks and
Cellular Metal Floor Deck with Electrical Distribution (Pub No. 29)

1.2.8 Steel Joist Institute (SJI) Publications

Standard Specifications, Load Tables and Weight Tables for Steel
Joists & Joist Girders (1994)

1.3 STRUCTURAL LOADING CRITERIA

Structural loading criteria shall be developed using the criteria sources and following the procedures indicated below. The Physical Fitness Center shall be classified as an Occupancy Category III facility for the purpose of calculating wind and snow loads. The Physical Fitness Center shall be classified as a Seismic Use Group II facility, in accordance with TM 809-04, for the purpose of calculating seismic loads.

1.3.1 Roof Live Loads

1.3.1.1 Snow Load

Roof snow load shall be calculated and applied in accordance with ASCE 7 and Army Corps of Engineers TI 809-52, using a ground snow load of 30 psf. Additional loading associated with snow drifting and unbalanced snow conditions shall be considered and applied in accordance with ASCE 7.

1.3.1.2 Rain Loads

Rain loads shall be considered in accordance with ASCE 7.

1.3.1.3 Minimum Roof Live Load

A minimum roof live load of 20 psf shall be used as a loading condition for the roof independent of the calculated snow load.

1.3.2 Floor Live Loads

Minimum uniformly distributed floor live loads shall be as listed below:

AREA	LIVE LOAD (psf)
Mechanical/Electrical Rooms	150
Locker Rooms	100
First Floor Corridors and Lobby	100
Laundry	150
Gymnasium	100
Stairs and landings	100
Running Track	100
Cardiovascular Room	100
Exercise Rooms	100
All Other Areas	100

The floors shall be capable of supporting an 2000 lb concentrated load applied over a 2.5 ft by 2.5 ft area positioned anywhere.

Structural systems for the Aerobics Room and Running Track shall be designed to have adequate stiffness to limit vibrations from running, walking and excercies activities. See "Design Criterion for Vibrations Due to Walking" (T.M. Murray, AISC Engineering Journal, Fourth Quarter, 1993, 117-129) and "Building Floor Vibrations" (T.M. Murrrray, AISC Engineering Journal, Third Quarter, 1991, 102-109) for additional information and criteria.

Stairs and landings be designed to support the uniform load listed above or a concentrated load of 300 lb on an area of 4 in², whichever produces the greater load effects.

1.3.3 Wind Loads

Wind loads shall be calculated in accordance with the procedures outlined in ASCE 7, using Exposure "C" and a Basic Wind Speed (3-Second Gust Speed) of 90 miles per hour. Wind loads for both the main wind-force resisting system and for components and cladding shall be considered.

1.3.4 Seismic Loads

The Physical Fitness Center shall be designed to withstand seismic loading in accordance with Army Corps of Engineers TI 809-04. Seismic Parameters for Buckley AFB are as follows:

S_s (Short Period Spectral Response Acceleration) = 0.19
 S_1 (1 Second Period Spectral Response Acceleration) = 0.058
Site Classification D.

Seismic Design Category B.

1.3.5 Dead Loads

Minimum design dead loads for common building materials shall be obtained from ASCE 7. Equipment loads and loads for materials not listed in that publication can be obtained from other recognized sources.

1.3.6 Lateral Partition Loads

The minimum design wind pressure on interior partitions shall be 10 psf normal to the partition.

1.3.7 Design Temperatures

Design differential temperatures shall be a minimum 130 degrees F for thermal analysis of framing systems.

1.3.8 Deflections

Roof and floor members and walls shall be designed to have deflections limited to the following maximums.

1.3.8.1 Floors

The deflection due to live load of structural members supporting floors shall not exceed 1/360 of the span.

1.3.8.2 Roofs

The deflection of structural members supporting roofs due to live, wind, or snow loadings shall not exceed 1/360 of the member span where plaster or other brittle ceiling materials are attached or suspended, and shall not exceed 1/240 of the member span where non-brittle ceiling materials are suspended.

1.3.8.3 Partitions

The deflection of interior partitions due to lateral pressures shall not exceed 1/360 of the span.

1.4 STRUCTURAL MATERIALS

Materials for structural elements shall be as indicated herein or on the attached architectural drawings. Where materials are not indicated, selection shall be at the Contractor's discretion, with the following limitations. Wood products are not acceptable for use as structural elements.

1.4.1 Structural Steel

1.4.1.1 Design

Structural steel shall be designed in accordance with AISC Specification for Structural Steel Buildings - ASD or LRFD. All structural steel members shall be designed by the structural engineer to support all applicable loads. Structural drawings shall clearly show all structural members, connections and their locations.

1.4.1.2 Connections

Types of connections shall be consistent with the design assumptions for the basic type of steel construction used. Connections shall be designed and detailed to provide adequate capacities for the applied forces and moments. Connection design shall be the responsibility of the structural engineer and shall not be delegated to the steel fabricator.

1.4.2 Steel Joists and Joist Girders

The design and selection of steel joists and joist girders shall be governed by the Steel Joist Institute (SJI) Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders. The net wind uplift requirements shall be clearly delineated on the drawings. Joists requiring special configurations or design to resist wind uplift and non-uniform loads shall be designated as such on the drawings and the required design loads indicated, per SJI recommendations. Joist end supports and anchorage to resist uplift shall be designed to accommodate the applied forces, including those resulting from wind and seismic activity.

1.4.3 Steel Decking

The design and selection of steel deck shall be in accordance with the provisions of the Steel Deck Institute (SDI) Design Manual. Minimum required section properties of deck sections shall be determined as prescribed by the appropriate Specifications of the SDI Design Manual, and shall be specified or indicated on the drawings. Where the steel deck is designed to function as a shear diaphragm, the design shall be in accordance with the provisions of the Steel Deck Institute (SDI) Diaphragm Design Manual and Army Corps of Engineers TI 809-04.

1.4.4 Masonry

1.4.4.1 Design

Masonry design shall be in accordance with ACI 530-92, AFM 88-3 Chap. 3 and Army Corps of Engineers TI 809-04. Reinforcement shall be sufficient to satisfy the calculated requirements for strength, shrinkage crack control, and seismic design. In no case shall reinforcement be less than the minimum seismic reinforcement required by TI 809-04. If masonry walls are used in conjunction with steel framing as non-load-bearing and non-shear-resisting elements, the connections between walls and the structural steel frames must be designed to allow vertical and horizontal frame deflection without transferring loads from steel to adjoining masonry walls.

1.4.4.2 Masonry Material Properties

Specified compressive strength of masonry shall be $f'_m = 1350$ psi. Hollow concrete masonry units shall conform to ASTM C90, Type I. Concrete building bricks shall conform to ASTM C55, Type I. Type S mortar shall be specified for all masonry. Specified compressive strength of grout shall be 2000 psi minimum.

1.4.4.3 Crack Control

Concrete masonry crack control measures comprised of masonry control joints, joint reinforcement, and bond beams shall be incorporated in the design of concrete masonry walls and partitions. Masonry Control Joints

(MCJ) shall be judiciously located at spacings no greater than the maximums recommended in AFM 88-3 Chap. 3 and shall be shown on the Architectural elevations. Control joints shall not be placed closer than 2 feet from openings.

1.4.5 Reinforced Concrete

1.4.5.1 Design

Reinforced concrete design shall be in accordance with ACI 318 and related current ACI publications which are applicable to the design, TI 809-02 and AFM 88-3 Chap. 15, and Army Corps of Engineers TI 809-04, as applicable. All concrete elements, including slabs-on-grade, shall be reinforced with temperature and shrinkage reinforcement as a minimum. Temperature reinforcement shall be as recommended by ACI and TI 809-02, as appropriate.

1.4.5.2 Concrete Strength

The required 28-day compressive strength of the concrete shall be left to the Contractor's discretion, except that 3000 psi shall be a minimum. For concrete that is to be installed with exterior exposure, air-entrainment, producing a total air content in the concrete between 4 and 7 percent by volume, shall be required. Concrete in contact with soil shall be made with the type of cement indicated in the Final Foundation Analysis].

1.4.5.3 Reinforcing Bar Usage Limitations

Grade 60 bars shall be used for concrete design. When available, grade 40 bars may be used for secondary reinforcement such as stirrups and ties. Minimum bar size shall be #4 bars except for stirrups and ties which may be #3 bars as per ACI.

1.4.5.4 Concrete Joints

Control joints and contraction joints shall be located to reduce concrete cracking to a minimum. All exposed concrete joints shall be sealed with appropriate joint sealants.

1.4.6 Precast Concrete

1.4.6.1 Design

The design shall conform with the requirements of ACI 318, Chp 16 - Precast Concrete. The precast units shall be designed for all applicable loads indicated in paragraph STRUCTURAL LOADING CRITERIA and the design shall consider all loading and restraint conditions from initial fabrication to completion of the structure. Flexural members shall be designed to support full live load acting in combination with full dead load, plus concentrated loads from any mechanical equipment actually furnished. The effects of initial and long-time deflections as well as transporting the units shall be considered in the design of precast members. Attachment of precast units shall be by welding, bolting or embedment of bars or other connection devices, at the Contractor's option.

1.4.6.2 Precast Concrete Strengths

The required 28-day compressive strength of precast concrete shall be left to the Contractor's discretion, except that 5000 psi shall be a minimum. For any precast units that are to be installed with exterior exposure,

air-entrained concrete, with a total air content between 4 and 7 percent by volume, shall be required.

1.5 STRUCTURAL FRAMING SYSTEMS

The structural systems used for the Physical Fitness Center shall be selected and designed by the Contractor. The lateral load resisting system shall incorporate bracing, moment resisting frames, shear walls, diaphragms, or any combination thereof, provided the elements of the system are compatible with the attached architectural floor plan. The seismic force-resisting elements shall conform to the requirements of TI 809-04 and FEMA 302. The structural framing system chosen shall meet all aforementioned project requirements and the requirements listed below.

1.5.1 Roof Framing

The roof buildings shall slope as required for the type of roofing system used. The roof slope shall be accomplished by sloping of the structural framing members. The design of roof framing members shall include consideration of any concentrated loads from suspended mechanical and electrical equipment, including cable trays and HVAC units. The location and magnitude of suspended equipment loads shall be closely coordinated with the mechanical and electrical system designs. See Section 01003 ARCHITECTURAL REQUIREMENTS for minimum and maximum structure elevation requirements.

1.5.2 Location of Structural Elements

Structural elements, including columns, bracing, shear walls and load-bearing walls shall be located as required by the structural design. The structural design and corresponding selection and location of structural elements shall be compatible with the floor plan, roof plan, elevations and other architectural drawings included in the attachments to this document. Columns shall be located adjacent to walls where possible, and in such a manner that doorways or other accessways are not obstructed. Free standing isolated columns should be minimized. Use of structural bracing shall be minimized, and shall be limited to locations where bracing is concealable at interior or exterior wall lines and does not obstruct windows, doors or other openings. Shear walls, where used, shall be located in coordination with architectural partition requirements.

1.5.3 Special Structural Design Requirements

The framing system design shall incorporate the following special provisions to prevent the possibility of progressive structural collapse in the event of significant damage to a portion of the building.

1.5.3.1 Exterior Walls

The exterior wall system shall be designed to transfer out-of-plane horizontal loads to adjacent floor elements or spandrel elements at floor levels through one-way vertical bending. Walls shall not transfer horizontal loads to columns between floor levels (horizontal bending). All exterior masonry walls shall be reinforced.

1.6 EXTERIOR/INTERIOR WALLS

Criteria indicated in Section 01003 ARCHITECTURAL REQUIREMENTS shall be

incorporated into the design of all walls. The Architectural floor plans included in the attachments to this document indicate the location of walls to be incorporated into the project.

1.6.1 Non-Load-Bearing Walls

Non-load-bearing walls shall be laterally braced by the structure, and shall be connected in a manner which provides for vertical deflection of the structure without inducing vertical loads into the walls.

1.6.2 Shear Walls

Shear walls, where used, shall be constructed of cast-in-place or precast reinforced concrete or reinforced concrete masonry units at the Contractor's choice. Shear walls shall be designed in accordance with ACI 318, ACI 530, AFM 88-3 Chap. 3, and Army Corps of Engineers TI 809-04.

1.7 FOUNDATION SYSTEMS

Design of foundation components shall be the responsibility of the contractor. The components of the foundation system shall be constructed of reinforced concrete. The required 28-day compressive strength of concrete for the foundations shall be left to the Contractor's discretion, except that 3000 psi shall be a minimum. All parts of the foundation system shall be designed to keep dead load footing pressures relatively uniform, in order to minimize differential settlements.

1.7.1 Earthwork

Earthwork for the Physical Fitness Center shall conform to the requirements set forth in Technical Specification 02315a EXCAVATION, FILLING AND BACKFILLING FOR BUILDINGS and to requirements stated in the Final Foundation Analysis (Attachment No. 2).

1.7.2 Foundation Systems

The foundation system for the Physical Fitness Center shall consist of a combination of spread footings and continuous strip footings under exterior walls.

1.7.3 Design Parameters

Parameters used for foundation design, including the allowable soil bearing pressure, lateral earth pressure coefficients and design footing depths shall be in accordance with the Final Foundation Analysis report provided in Attachment No. 2. The allowable soil bearing pressure represents the allowable soil stress at the base of footings in excess of that due to existing overburden. The weight of any fill added to the site above that required for frost protection shall be subtracted from the allowable soil bearing pressure to arrive at a net allowable pressure due to structural loads.

1.7.4 Foundation Perimeter Insulation

Perimeter insulation shall be installed on the interior face of all exterior perimeter foundation walls. Insulation shall extend from the bottom of the floor slab down to top of footing or down to design frost depth.

1.7.5 Structural Stoops at Exterior Doorways

All exterior pedestrian doorways require structural stoops. Stoops shall have foundation walls extending down to frost depth and shall be rigidly attached to building foundation walls. Stoops shall have a 12 inch layer of uncompacted fill placed directly beneath the stoop slab. The stoop slab shall be flush with the interior floor slab at the threshold and shall slope away from the building at 2% minimum slope.

1.8 CONCRETE FLOOR SLABS-ON-GRADE

Design of slabs shall be in accordance with TI 809-02, AFM 88-3 Chap. 15, and the following detailed instructions:

1.8.1 General

Slabs shall be designed as "floating slabs" without rigid edge support, and with lateral and vertical movement unrestrained, except where noted below. Where compressible filler is used as a cushion, its thickness shall be not less than 2 inches. An isolation joint, consisting of a 1/2 inch layer of expansion joint material, is required where slabs abut vertical surfaces. Slab thicknesses shall be selected in accordance with TI 809-02 or as required by design. Slabs shall be reinforced with a minimum of 0.1 percent steel based on cross sectional area. Crack control measures shall be incorporated in the slab design. Control joint details and spacings shall be as delineated in TI 809-02. The required 28-day compressive strength of concrete for slabs shall be left to the Contractor's discretion, except that 3000 psi shall be a minimum.

1.8.2 Interior Concrete Slabs-on-Grade

Interior slabs-on-grade shall be placed over a 6 mil polyethylene vapor barrier and a capillary water barrier material not less than 6 inches in compacted thickness. The vapor barrier shall be placed between the slab and the capillary water barrier. All slab crack control joints, construction joints, isolation joints between edges of slabs and vertical surfaces, and any mechanical, plumbing or electrical penetrations through the floor slab shall be sealed with a flowable polyurethane caulk.

1.8.2.1 Capillary Water Barrier Layer

Capillary Water Barrier material shall consist of clean, crushed, nonporous rock, crushed gravel, or uncrushed gravel. The maximum particle size shall be 1.5 inches and no more than 2 percent by weight shall pass the No. 4 sieve. The capillary water barrier shall be placed in a minimum of 2 lifts, each compacted by a hand operated, vibratory compactor.

1.8.3 Slabs to Receive Quarry Tile, Ceramic Tile or Floor Mat Finish

Slabs to receive finishes requiring an inset grout bed or frame shall be 5 inches uniform in thickness, and shall be reinforced with #4 bars at 12 inches o.c. each way. Slabs shall be depressed as necessary to receive the ceramic tile or the floor mat and frame. At interior edge locations, the slab shall be thickened and doweled into the adjacent slab with 3/4 inch diameter x 16 inch long dowels at 12 inches o.c.. At locations where the slab abuts an exterior foundation wall, it shall be supported by the wall.

1.8.4 Concrete Floor Slab Finishes

Exterior ramps and loading docks shall be given a non-slip finish. Slab finishes in other portions of the building shall be left to the discretion of the contractor, subject to the approval of the Contracting Officer.

1.8.5 Interior Equipment Pads

Floor mounted mechanical and electrical equipment shall be installed on 6 inch thick raised concrete housekeeping pads. The pads shall be reinforced with at least the minimum temperature reinforcement required. The pads shall be sized 6 inches larger all around than the piece of equipment furnished and all edges of the pad shall be chamfered.

1.8.6 Equipment Vibration Isolation

All vibration producing mechanical and electrical equipment shall be mounted in such a manner as to prevent the transfer of vibrations to adjacent parts or areas of the building. If necessary for any large vibration producing equipment installed within the facility, the equipment will be supported on individual isolated foundations. The isolated foundation shall be separated from the building slab by a continuous 3/4 inch expansion joint.

1.9 OTHER STRUCTURAL WORK

1.9.1 Standing Seam Metal Roof System

Standing seam metal roof shall comply with the requirements set forth in Technical Specification 07416a STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM. Final drawings shall provide a list of loading criteria, including roof live and wind uplift loads. A wind uplift diagram shall be used to identify wind uplift pressures and their locations on the roof.

1.9.2 Exterior Equipment Pads

Any exterior mechanical or electrical equipment shall be installed on concrete pads. The pads shall be a minimum of 8 inches thick and shall be reinforced with at least the minimum temperature reinforcement required. The pads shall be sized 12 inches larger all around than the piece of equipment furnished and all edges of the pad shall be chamfered. Design of exterior pads shall be coordinated with Mechanical and Electrical system designs.

1.9.3 Exterior Screen Walls

Exterior screen walls for the purpose of concealing equipment shall be constructed of cast-in-place concrete or concrete masonry units, and shall have a facing to match or compliment the exterior of the main building. Screen wall footings shall extend below frost depth.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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SECTION 01006

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12/07/01

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PART 2 NOT USED

PART 3 NOT USED

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SECTION 01006

MECHANICAL REQUIREMENTS

12/07/01

PART 1 MECHANICAL REQUIREMENTS

1.1 MECHANICAL SYSTEMS CRITERIA

1.1.1 General Parameters/References

Mechanical systems, including HVAC systems, plumbing, exterior gas distribution, gas piping and building temperature controls shall be designed to comply with this section and the documents listed below to the extent referenced in this section. The publications are referred to in the text by basic designation only. The latest edition of the following standards and codes in effect and amended as of date of supplier's proposal, and any subsections thereof as applicable, shall govern design and selection of equipment and material supplied:

Air Force Manual (AFM) 88-36/Army Technical Manual (TM) TM 5-815-2, Energy Monitoring and Control Systems EMCS).

American Conference of Government Industrial Hygienists (ACGIH Industrial Ventilation: A Manual of Recommended Practice

American College of Sports Medicine, (ACSM) Health/Fitness Standards and Guidelines, 2nd Edition, Stephen J. Tharrett and James A Peterson Editors (C) 1992.

American Society for Testing and Materials (ASTM) publications - A53.

American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE):

Guides:

Terminology of HVAC&R, Second Edition;
Guideline 1, The HVAC Commissioning Process;
Guideline 3, Reducing Emission of CFC Refrigerants in Refrigeration;
Guideline 12, Minimizing the Risk of Legionellosis Associated with Building Water Systems.
Guideline 13, Specifying Direct Digital Control (DDC) Systems

Handbooks:

2001 Fundamentals;
2000 HVAC Systems & Equipment;
1999 HVAC Applications;
1998 Refrigeration.

Practices:

ASHRAE Terminology of HVAC&R, 2nd Edition, 1991;
Pocket Guide for Air-Conditioning.

Standards:

15-1994, Safety Code for Mechanical Refrigeration;

55a-1995 Thermal Environmental Conditions for Principles of
Heating, Ventilating and Air-Conditioning;

62-1999 Ventilation for Acceptable Indoor Air Quality;

90.1-2001 Energy Standard for Buildings Except Low-Rise
Residential Buildings (IESNA COSPONSORED) (ANSI COSPONSORED); 1999
version w/12 amendments.

52.1-1992 Gravimetric and Duct Spot Procedures for Testing
Air-Cleaning Devices Used in General Ventilation for Removing
Particulate Matter;

52.2-1999 Testing General Ventilation Air-Cleaning Devices for
Removal Efficiency by Particle Size;

129-1997 Mearnsing Air-Change Effectiveness;

BACnet 135-2001 A Data Communication Protocol for Building
Automation and Control Networks (ANSI COSPONSORED)

American Society of Mechanical Engineers (ASME), 22 Law Drive, P.O. box
2900, Fairfield, N.J. 07007-2900, A17.1 Safety Code for Elevators &
Escalators, ASME, 1996; B36.10, 61; section 8 & 9.

Army Technical Instructions TI 809-04 Seismic Design for Buildings, dated
December 1998.

Air Force Engineering Technical Letter (ETL) 94-2 Utility Meters in New and
Renovated Facilities

Engineering Technical Letters (ETL) 94-4 Energy Usage Criteria for
Facilities in the Military Construction Program.

Air Force Engineering Technical Letter (ETL) 00-5 Seismic Design for
Buildings and Other Structures

DRAFT Department of Defense Antiterrorism Construction Standards, XX , 2001

Engineering Technical Letters (ETL) ETL 1110-3-483, Engineering Design
Clothes Dryer Exhaust Venting

Energy Policy Act of 1992 (Public Law 102-486).

Executive Order 12902, Energy Efficiency and Water Conservation at Federal
Facilities, dated March 8, 1994.

Executive Order 13123, Greening the Government Through Efficient Energy
Management dated 3 June 1999.

Instrument Society of America Standard (ISA S75.01).

National Fire Codes (NFPA):

13 Installation of Sprinkler systems - 1996,
54 National Fuel Gas Code - 1996,
72 National Fire Alarm Code - 1996,
90A Installation of Air Conditioning and Ventilating Systems - 1996,
90B Installation of Warm Air Heating and Air Conditioning Systems - 1996,
96 Ventilation Control and Fire Protection of Commercial Cooking
Operations - 1998
211 Chimneys, fireplaces, Vents and solid Fuel Burning Appliances - 1996.

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National Electrical Safety Code, IEEE, 1997.

National Sanitation Foundation

National Swimming Pool Foundation, 10803 Gulfdale Suite 300, San Antonio,
TX 78216.

SMACNA - HVAC Systems - Duct Design, 1990.

SMACNA -HVAC Duct Construction Standard - Method and Flexible, 2nd Edition,
1998.

Title 10 CFR, Part 435, Subpart A, pages 4535-4720 inclusive, Energy
Conservation Voluntary Performance Standards for New Commercial and
Multi-family High Rise Residential Buildings, Mandatory For New Federal
Buildings Published January 30, 1989.

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Cycle Cost Methodology and Procedures, January 25, 1990.

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Uniform Building Code, ICBO, 1997; no amendments.

Uniform Mechanical Code, ICBO, 1997; no amendments.

Uniform Plumbing Code, ICBO, 1997.

USAF Fitness Facilities Design Guide dated October 1999

Available at: www.afcee.brooks.af.mil/dc/dcd/arch/fitness/siteoutline.html

US Green Building Council's Leadership in Energy & Environmental Design
(LEED) <http://www.usgbc.org/>

WinLCCID - Life Cycle Cost in Design for Windows from USACERL (Support
available @ (217) 333-3977

1.2 GENERAL REQUIREMENTS

The mechanical design shall consist of heating, ventilating, and
air-conditioning, gas distribution, HVAC controls and plumbing. Drawings,
specifications, design analysis and calculations shall be provided for both
the 60 percent design and Final design submittals, and shall be in
accordance with SECTION 01336 - 60 PERCENT DESIGN REQUIREMENTS, & SECTION

01338 - 100 PERCENT DESIGN REQUIREMENTS and FINAL BACKCHECK DESIGN SUBMITTALS.

This chapter contains instructions and engineering requirements for the mechanical design of the following:

- Equipment Identification and Abbreviations.
- Identification of Piping.
- Protection for Mechanical Piping and Equipment.
- Thermal Insulation of Mechanical Systems.
- Plumbing Systems.
- Exterior Gas Distribution Systems.
- Interior Gas Piping Systems.
- Hydronic Heating Systems.
- Heating, Ventilating, and Air-conditioning Systems.
- Refrigeration/Chilled Water Systems.
- Building Temperature Control Systems.
- Testing, Adjusting, and Balancing of HVAC Systems.
- Technical Specifications.
- Energy Use Budget (EUB) Compliance Check.
- Training.
- Commissioning of HVAC.
- LIFE CYCLE COST ANALYSIS (LCAA)

a. Provide new mechanical systems, complete and ready for operation. The design and installation of all mechanical systems, including manufacturer's products, shall meet the instructions and requirements contained herein and the requirements of the provided technical guide specifications. Where conflicts between these instructions and the guide specifications or criteria exist, these instructions shall take precedence. Any installation requirements within these instructions, but not contained in the specifications, shall be added to the specifications or shown on the drawings. For minimum specification requirements see paragraph TECHNICAL SPECIFICATIONS.

b. Mechanical designs shall give maximum consideration to the comfort of the occupants. The design shall also be economical, maintainable, energy conservative and shall take into account the functional requirements and planned life of the facility. Mechanical designs shall also consider life cycle operability, maintenance and repair of the facility and real property installed equipment components and systems. Ease of access to components and systems in accordance with industry standards and safe working practices is a design requirement. All like equipment and accessories shall be from a single manufacturer.

c. Standard Products - Material and equipment shall be a standard product of a manufacturer regularly engaged in the manufacture of the product and shall be essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. The label or listing of the Underwriters Laboratories, Inc., will be accepted as evidence that the materials or equipment conform to the applicable standards of that agency. In lieu of this label or listing, a statement from a nationally recognized, adequately equipped testing agency indicating that the items have been tested in accordance with required procedures and that the materials and equipment comply with all contract requirements will be accepted.

d. Calculations shall be provided for all mechanical equipment such as boilers, heating & cooling coils, chillers, unit heaters, piping, pumps, expansion tanks, fans, ducts, louvers, gas services and piping, plumbing,

water heaters, gas distribution and etc. Heating and cooling calculations may be provided by computer analysis i.e., Elite Software Inc., Trane Trace Load 700, Carrier E20-II Hourly Analysis Program (HAP) version 3.04 loads program etc. Provide a block heating load on the facility to be used for boiler sizing. Heat Loss calculation shall use actual design U-values. Add piping losses allowance of 15 percent safety factor. Design Energy Usage shall meet or be below Energy Use Budget target (see paragraph ENERGY USE BUDGET (EUB) COMPLIANCE CHECK).

e. Design Energy Usage shall meet or be below Energy Use Budget target (see paragraph ENERGY USE BUDGET (EUB) COMPLIANCE CHECK). This shall be accomplished by increasing glazing, roof or wall insulation as necessary but, it shall not be below the level required by section 01003 ARCHITECTURAL BUILDING REQUIREMENTS. Also, develop and use building modeling and analysis techniques to establish a base case that meets the minimum prerequisite standard ASHRAE/ISNA 90.1-1999. Then compare the baseline design energy cost budget for regulated energy components described in the requirements of ASHRAE/ISNA Standard 90.1-1999 as demonstrated by a whole building simulation using the Energy Cost Budget Method described in Section 11 of that document, with the actual energy COST budget for this project in percentile. Regulated energy components include HVAC systems, building envelope, service hot water systems, lighting and other regulated systems, defined by the standard. Identify the percentile the actual design energy cost budget is above or below the baseline case in the design analysis.

1.2.1 Fitness Facility Description

The new modern Fitness Facility with Health and Wellness Center (HAWC) is to provide a facility which will meet the Air Force requirements of active duty residents (Air Reserve and National Guard residents) for fitness centers in relation to U.S. Services Agency Standards for an installation. To provide support and improve the quality of life by promoting readiness, fitness, morale and physical fitness of military members and their families. The Fitness Center shall be a stand alone Facility. It will incorporate various fitness and HAWC functional areas dedicated to conducting comprehensive and balanced programs for physical fitness. These include aerobics, health and nutritional training as well as indoor recreational athletic programs as participants or spectators. It will consist of a lobby, waiting areas, storage areas, administration, support, locker rooms including restrooms and showers (and saunas); gymnasium; pool, whirlpools; group exercise, fitness equipment spaces, racquet ball courts; weight, resistance, aerobic and cardiovascular training; offices, staff laundry and an HAWC. The Health and Wellness Center (HAWC) will include a reception/lobby space, offices, classroom, computer library, ergometry stations (ERGO), areas for wellness assessment, a resource library and storage areas. The final product will meet the standards of the American College of Sports Medicine, and all other DOD and Air Force fitness facility salient requirements or referenced requirements of this section. The following enhanced areas shall be provided: V.I.P. Lockers, indoor running track, HAWC Kitchen/Food Demonstration room, pool, whirlpools, expanded retail sales, expanded juice bar, and HAWC Relaxation room (Massage room).

a. The facility shall be occupied (24) hours per day, (7) days per week. Mechanical rooms, electrical rooms except communication equipment rooms, vestibules, janitor's closets, and interior storage shall be assumed as unoccupied. The following are occupied spaces, personnel required, number of computers, etc, and where load information is to be coordinated/obtained

from the Electrical Design Engineer:

VAV systems AHU shall be designed with a diversity of .85 (85 percent) with respect to the total zone peak loads flowrates.

Room	Room #	Max. Personnel	PC/monitor/printer
LOCKER ROOMS:			
Vestibule(s)	156/176	0	-
Men's Locker Room	159	172	-
Men's Toilet room	161	20	-
Men's Dry off area	162	?	-
Stair	164	0	-
Men's Shower area	165	23	-
Women's Locker Room	176	188	-
Women's Toilet Room	177	11	-
Women's Shower area	173	4	-
Janitor/Storage	159	0	-
Janitor/Storage	159	0	-
Vestibule	178	0	-
Women's Shower room	175	10	-
SUPPORT SPACE:			
Vestibule	101	0	-
Vestibule	112	0	-
Lobby/Waiting	102	1	1
Control Center	188	4	4
Corridor	104	0	-
Vestibule	137	0	-
Janitor/storage room	154	0	-
Men's Toilet	155	10	-
Communications Room	166	1	see elect.
Women's Public Toilet	179	5	-
Storage/Laundry	185	4	-
Staff Office(s)	184, 186, 187	3 each	3 each
Staff Break room	183	8	-
Elevator	xxx	0	-
Elevator Equipment	146	0	-
HAWC Area BID OPTION:			
Corridor(s)	111	1	-
Waiting Area	112	6	1
ERGO Station	113,114,115,116,117,118,119,120	2 each	2 each
Wellness Assessment	121,122	2 each	2 each
Office(s)	123,124	3 each	3 each
Vestibule	125	0	-
Reception	126	2	2
Library/Waiting	127	2	2
Office	128	3	2
Computer Library	129	2	2
Storage	130	0	-
Janitor's Closet	131	0	-
Corridor	132	1	-
Women's Toilet	133	2	-
Men's Toilet	134	2	-
Food Demonstration	135	32	2

Classroom	136	25	2
Vestibule	137	0	-
Relaxation Room	138	1	-

SPORTS SPACES:

Gymnasium(s)	60 for practices		
	100 for intramural games (courts split)		
	200-300 for championship games		2

Storage	142	0	-
Stairs	143/145	0	-
Corridor	144	0	-
Racquet ball Courts	147, 148, 149, 150	8 each	-

FITNESS AREAS:

Small Group Exercise	105, 106	12	-
Large Group Exercise	107	30	-
Storage	108	1	1
Weight Room:	139		
Free weights		23	-
Resistance Weight - Training		28	-
Running Track	201	20	-
Corridor	202	8	-
Cardiovascular Equipment	203	36	see elect.

ENHANCED SPACES:

Juice Bar	103	4	-
Men's DV Locker	153	28	-
Sauna Room	158	8	-
Women's Sauna	173	8	-
Pool Office	174	3	3
Women's DV Locker	181	9	-

Pool Area BID OPTION:

Pool Mech. Room	167	0	-
Pool Storage Room	168	0	-
Lap Pool(Whirlpools)	169	16	-

1.2.2 Not Used**1.2.3 Design Conditions**

The following conditions shall be used in designing the mechanical systems:

1. Site Elevation:

Equipment design elevation is 5663 feet (1725 meters) above sea level. Appropriate +corrections shall be made when calculating the capacity of all mechanical equipment installed at this elevation.

2. Latitude: 39.72 Deg N

Heating Degree Days: 6239 annual (°F)(3651 annual (18°C)

Cooling Degree Days: 582 annual (°F)(338 annual (18°C)

3. Outside Design Conditions:

Winter:

(1°F)(-17.2°C) DB for outside makeup air and infiltration loads.

(-6°F)(-21.1°C) DB for transmission loads.

Summer:

(92°F)(33.3°C) DB; (60°F)(15.5°C) MCWB for building loads
(95°F)(35°C) DB air cooled equipment.

In accordance with USAF Fitness Facilities Design Guide.

4. Inside Design Conditions:

Winter: (45°F)(7°C) for Mechanical and electrical rooms, vestibules and other unoccupied areas.

(50°F)(10°C) Elevator Machine Room

(68°F)(20°C) for Administrative areas/Communications equipment room, laundry, locker rooms, control points, cardiovascular rooms, offices, resistance weight - training, corridors and lobby; Courts and gymnasium/running track all with 40% - 60% RH per ACSM.

AFI 40-501, The Air Force Fitness Program (for ERGO stations):

(68-70 °F)(20-21.1°C) ERGO Stations

(66-70 °F)(18.9-21.1°C) Group Exercise

(68-72 °F)(20-22.2°C) Basketball courts, resistance - training and cardiovascular rooms

(60-68 °F)(15.6-20°C) Racquet ball courts

(80°F)(26.7°C) or (2°F)(-16.7°C) greater than the pool water temperature with (50-60% RH) for Pool/Whirlpool(s)

Summer: (78°F)(25.6°C) for administrative areas/Communications equipment room, laundry, locker rooms, control points, cardiovascular rooms, offices, resistance weight - training, corridors and lobby; Courts and gymnasium/running track all with 40% - 60% RH ASCM.

(98.6°F)(37°C) for mechanical, electrical rooms and other related areas

(80.6°F)(27°C) Elevator Machine Room

AFI 40-501, The Air Force Fitness Program (for ERGO stations):

(68-70 °F)(20-21.1°C) ERGO Stations

(66-70 °F)(18.9-21.1°C) Group Exercise

(68-72 °F)(20-22.2°C) Basketball courts, resistance - training and cardiovascular rooms

(60-68 °F)(15.6-20°C) Racquet ball courts

(80°F)(26.7°C) or (2°F)(-16.7°C) greater than the pool water temperature with (50-60% RH) for Pool/Whirlpool(s)

5. Minimum Ventilation Requirements:

General 20 cfm (10 L/s) supply of outside air per person.

Spectators 15 cfm (8 L/s) supply of outside air per person.

Toilets and Lockers (2 cfm) (10 L/s) supply of outside air per person or 2 cfm per square feet (10 L/s exhaust per square meters) restrooms & (2.5 cfm per square feet) (12.5 L/s exhaust per square meters) showers whichever is greater.

ERGRO stations and tape and tape/screen exhaust (120 cfm) (56.6 L/s).

6. Minimum Supply Air Requirements:

General	8-12 air changes per hour.
Spectators	8-12 air changes per hour.
Toilets and Lockers	8-12 air changes per hour (negative pressure);
20 - 30 AC/hr in wet areas.	
Pool/Whirlpool(s)	4-6 AC.hr

ERGRO stations and tape and tape/screen exhaust (8 air changes per hour during occupied times).

7. Cooling Loads:

Lighting/communication equipment room. - Coordinate with Electrical designer (communications equipment shall be assumed 100% resistive heating)

PC/monitor/printer	= 400 watts total per station
Staff/Visitors	- 75 Watts/person sensible and 60 Watts/person latent moderately active office work per ASHRAE Handbook of Fundamentals
Athletes	- 208 Watts/person sensible and 319 Watts/person latent
Weight Lifting	- 186 Watts/person sensible and 283 Watts/person latent
Aerobics	- 89 Watts/person sensible and 160 Watts/person latent
Solar, Transmission, Infiltration (crack method), etc.	- ASHRAE Handbook of Fundamentals

8. Building Pressurization:

Entire building shall be pressurized. Negative pressurization see paragraph MINIMUM VENTILATION REQUIREMENTS.

9. Anti-terrorism & Force Protection:

As applicable, the following shall be provided for all new mechanical systems:

a. Air intakes. Air intakes to heating, ventilation, and air conditioning (HVAC) systems that are designed to move air throughout a building that are at ground level provide an opportunity for aggressors to easily place contaminants that could be drawn into the building.

1) New buildings. For all new buildings covered by this document locate all air intakes at least 3 meters (10-ft) above the ground.

b. Emergency air distribution shutoff. For all new buildings provide an emergency shutoff switch in the HVAC control system that can immediately

shut down air distribution throughout the building. The switch (or switches) must be located to be easily accessible by building occupants. Providing such a capability will allow building occupants to limit the distribution of airborne contaminants that may be introduced into the building.

c. Utility distribution and installation. Utility systems can suffer significant damage when subjected to the shock of an explosion. Some of these utilities may be critical to safely evacuating personnel from the building or their destruction could cause damage that is disproportionate to other building damage resulting from an explosion. To minimize the possibility of the above hazards apply the following measures:

1) Utility routing. For all new buildings route critical or fragile utilities such that they are not on exterior walls.

2) Redundant utilities - Not Used.

d. Equipment bracing. Mount all overhead utilities and other fixtures to minimize the likelihood that they will fall and injure building occupants. Design all equipment mountings to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment weight in the downward direction. This standard does not preclude the need to design equipment mountings for forces required by other criteria such as seismic standards.

e. Under building access. To limit opportunities for aggressors placing explosives underneath buildings, ensure that access to crawl spaces, utility tunnels, and other means of under building access is controlled.

f. Mass notification. All buildings must have a timely means to notify occupants of threats and instruct them what to do in response to those threats.

1) New buildings. All new buildings must have a capability to provide real-time information to building occupants or personnel in the immediate vicinity of the building during emergency situations. The information relayed must be specific enough to discriminate appropriate response actions. Any system, procedure, or combination thereof that provides this capability will be acceptable under this standard.

1.2.4 Mechanical Room Layout Requirements

The mechanical equipment room layouts shall be provided with ample floor space to accommodate routine maintenance of equipment and have head-room to accommodate required equipment. Ample space shall be provided around equipment to allow unobstructed access for entry, servicing, and routine maintenance. Space provided in rooms for service and/or replacement of filters, coils, motors, and other equipment items shall be indicated with broken (dashed) lines on the drawings. Provisions for installation, removal, and future replacement of equipment shall be coordinated with the architectural design. The as-built drawings shall be provided in accordance with Section 01040, AS-BUILT DRAWINGS. When Fire Protection risers and equipment is located in a mechanical equipment room, the dedicated fire protection space shall be indicated by a dashed line and noted "Fire Protection Space". The arrangement, selection, and sizing of all mechanical equipment shall be such that it can be broken down and removed from the building without dismantling any adjacent systems or structures. A 60 percent design submittal shall be provided for approval to verify mechanical room layout. **Mechanical rooms shall be sized for the**

basic loads plus future bid options.

1.2.5 Mechanical/Electrical Equipment Coordination

Arrangement of all mechanical equipment and piping shall be coordinated with electrical work to prevent interference with electrical conduits that may run through the mechanical room and to insure adequate space in shared chases. Mechanical equipment (pipes, ducts, etc.) shall not be installed over or within space which is dedicated to transformers, panelboards, or other electrical equipment. When electrical equipment is located in a mechanical equipment room, the dedicated electrical space shall be indicated by a dashed line and noted "Electrical Equipment Space".

1.2.6 General Piping Requirements

As applicable, the following shall be provided for all new mechanical systems:

- a. All piping and equipment located in finished areas of the building shall be concealed or furred-in; exposed piping and equipment is only allowed in utility, gymnasiums, equipment, storage and other rooms of this nature.
- b. Provide isolation valves, balancing valve, flow measuring device, and pressure/temperature test taps at all heating and/or cooling units, pumps, chillers, hot water unit heaters, etc..
- c. All coils shall be provided with valved drain and air vent connections.
- d. Air vents shall be installed on all high points in piping systems. Drain valves shall be installed at low points and at equipment which must be dismantled for servicing.
- e. Strainers shall be provided with a valved blowdown connection.
- f. All vents, drain valves, and strainers which are located out of mechanical room spaces shall be provided with hose-end connections. All vents, drain valves, and strainers which are located within mechanical room spaces shall be piped to a floor drain.
- g. Provide bypass piping with a balancing globe valve or cock around all non-redundant control and regulating valves. (Not applicable to Fan Coil Units.)
- h. All butterfly valves shall have spool pieces upstream and downstream so that the disk can not enter any adjacent fitting.
- i. Except at pump intake connections, eccentric reducers shall not be used.
- j. Where steel flanges mate with cast-iron flanges, provide flat faces and full face gaskets.
- k. Piping and supports shall not interfere with equipment maintenance access or pull space.
- l. Dielectric unions shall be installed between dissimilar metals in soldered and threaded piping systems and insulated flanges shall be

installed for welded systems.

m. All underground metallic lines, fittings, and valves; except for cast-iron soil and storm drain piping systems, shall be cathodically protected in accordance with Electrical Section paragraph entitled "Cathodic Protection".

n. All exterior, underground non-metallic piping shall be buried with pipe detection tape. See also, paragraph SERVICE LINE PROTECTION.

o. Water and natural gas service lines shall be metered where they enter the building and buried with pipe detection tape and tracer wire.

p. All centrifugal pumps, regardless of service, shall be non-overloading allowing the pump to operate at any point in its characteristic curve.

r. A thermometer shall be installed on the supply and return piping to/from each coil. Thermometers shall be legible to service mechanics standing at ground level.

s. Temperature/pressure taps shall be provided on the supply and return piping of each coil.

t. Pipe taps, suitable for use with temperature or pressure probe, shall be located at each pressure gauge.

1.2.7 Roof Mounted Equipment

Except for plumbing vents, exhaust fans and louvered intake or relief penthouses mechanical equipment shall not be located on the roof of the facility.

1.2.8 Vibration Isolation/Equipment Pads

Provide vibration isolation devices on all new floor mounted or suspended mechanical equipment capable of 98 percent efficiency. All new floor mounted mechanical equipment shall be provided with 6 inch (150 mm) thick housekeeping pads which extends 6 inch (150 mm) all around equipment provided.

1.2.9 Permanent Maintenance Instrumentation

Provide sufficient instrumentation to aid maintenance personnel in balancing and/or troubleshooting mechanical systems. Instrumentation shall be provided in the media at each change in temperature and at all mixing points in air handling systems, at all discharges of air handlers, and at all return mains. Pressure gauges, thermometers, flow indicators, sight glasses, etc., shall be installed to be easily read from the adjacent floor. Separate pressure gauges shall be installed on both the suction end and discharge end of pumps. Provide an isolation valve on all pressure gauges. Thermometers shall have separable socket thermowells. Allow for the removal, repair, or cleaning of flow measuring devices without having to shut down the system. Provide a portable meter, with appropriate range, for each type of flow measuring device installed.

1.2.10 Temporary Control Instrumentation

Instrumentation shall be provided for the field calibration of all control

and monitoring devices, and for the commissioning of the mechanical systems. Provide local indication measuring instrumentation for each of the HVAC control system components. Local instruments are to be independent of sensing devices used for the control system. The exceptions are air flow measuring stations, turbine flow meters, pitot tubes, and other flow measuring devices that may be shared as sensing devices by local indicating devices and control system devices and are required to be permanent. Local instruments are to be of industrial quality, must be certified as being factory calibrated, and must be capable of field calibration using standard procedures. Measuring provisions shall be provided at each varying input and control output in the system.

1.2.11 Color Coding Scheme for Locating Hidden Utility Components

To identify points of access for maintenance and operation of hidden utility components, a color coding scheme shall be provided for all areas of the facility where suspended grid ceilings are installed. Color coding scheme shall meet the requirements of Technical Specification 09900, PAINTING, GENERAL.

1.2.12 Utility Interruptions

Certain limitations on utility interruptions apply. Unauthorized utility interruptions will not be permitted. Any work that requires a utility interruption shall be scheduled in advance. Outages are subject to postponement or cancelation by site authorities without prior notification. Coordination requirements of utility interruptions shall be in accordance with SECTION 00800 SPECIAL CONTRACT REQUIREMENTS. All utility interruptions shall be identified with notes on the project drawings.

1.2.13 Power Outage Start-Up

Upon an electrical power outage, all air handling units, pumps, and other major mechanical equipment will shut down and shall be restarted in a logical and efficient manner. Timing between starts and sequence of equipment starting upon restoration of electrical power shall be provided and programmed into the HVAC temperature control system, with programming capable of being changed by the operating personnel.

1.2.14 Spare Parts Lists

Recommended spare parts lists that require more than a 60 day lead time, and/or any special service tools shall be provided to the Government at the Final Inspection.

1.2.15 Equipment Room Diagrams

The following "As-Built" information, permanently mounted in a frame and covered by clear plexiglass, shall be provided in the mechanical equipment rooms:

- a. Air distribution diagrams and damper schedules.
- b. Hot water piping diagrams and valve schedules.
- c. Control diagrams, control device schedules, and sequences of operation.

1.2.16 Interior Design - Color Coordination

All mechanical items located in finished areas and on exterior walls, shall be coordinated with and painted to match the color scheme requirements of Technical Specification 09915, COLOR SCHEDULE.

1.3 EQUIPMENT IDENTIFICATION AND ABBREVIATIONS

This Section contains requirements for the identification and abbreviation of mechanical equipment.

1.3.1 Equipment Identification

Provide a brass name tag for each valve, temperature control device, control system device, etc., installed in all mechanical systems. In addition, all mechanical equipment shall be clearly identified with a conspicuously located, permanent label. Mechanical equipment shall be identified by type and sequence number. For example, the air handling unit in the building shall be identified as AHU-1, the first hot water pump shall be HWP-1, the second hot water pump shall be HWP-2, etc.

1.3.2 Abbreviations

The following list of abbreviations shall be used to describe the HVAC equipment types:

<u>A</u> ir <u>D</u> ryer	AD
<u>A</u> ir <u>H</u> andling <u>U</u> nit	AHU
<u>B</u> oi <u>L</u> e <u>R</u>	BLR
<u>C</u> abinet <u>U</u> nit <u>H</u> eater	CUH
<u>C</u> hilled <u>W</u> ater <u>P</u> ump	CWP
<u>C</u> ontrol <u>A</u> ir <u>C</u> ompressor	CAC
<u>C</u> ontrol <u>V</u> alve	CV
<u>D</u> omestic <u>W</u> ater <u>H</u> eater	DWH
<u>E</u> xhaust <u>F</u> an	EF
<u>E</u> xpansion <u>T</u> ankET
<u>F</u> an <u>C</u> oil <u>U</u> nit	FCU
<u>F</u> ilter <u>B</u> ank	FB
<u>F</u> in <u>T</u> ube <u>R</u> adiation	FTR
<u>G</u> ov't <u>F</u> urnished <u>C</u> ontractor <u>I</u> nstalled	GFCI
<u>G</u> ov't <u>F</u> urnished <u>G</u> ov't <u>I</u> nstalled	GFGI
<u>H</u> ot <u>W</u> ater <u>P</u> ump	HWP

Horizontal Unit Heater HUH
Local Control Panel LCP
Motor Operated Damper MOD
Not In Contract NIC
ReHeat Coil RHC
Relief Hood RH
Supply Fan.SF
Transfer Fan TF
Vertical Unit Heater VUH

1.4 IDENTIFICATION OF PIPING

All exposed and concealed piping in accessible spaces shall be identified with color coded bands and titles in accordance with the requirements of Technical Specification 09900 PAINTS AND COATINGS.

1.5 PROTECTION FOR MECHANICAL PIPING AND EQUIPMENT

This Section contains instructions and engineering requirements relating to the protection design of new mechanical piping, ductwork, and equipment. This Section contains instructions and engineering requirements relating to the protection design of new mechanical piping, ductwork, and equipment. Structural bracing and mounting of mechanical equipment shall be designed in accordance with Technical Specification 13080 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT. In addition see Anti-terrorism & Force Protection requirements for additional requirements.

a. The facility shall be designed in accordance with Technical Specification 13080 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT.

b. The mechanical design for the facility shall meet the requirements of Technical Specification 15070A SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT.

1.5.1 Piping

Piping within the facility, except fire protection piping, is required to have restraints. All water pipes for fire protection systems shall be designed under the provisions of the current issue of the "Standard for the Installation of Sprinkler Systems" of the National Fire Protection Association NFPA 13, see Section 01008 FIRE PROTECTION REQUIREMENTS.

1.5.2 Ductwork

Ductwork within the facility, is required to have restraints.

1.5.3 Floor Mounted or Suspended Equipment

See Specification 13080A SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT for

requirements in securing floor mounted and suspended equipment within the facility.

1.5.4 Miscellaneous Equipment

Miscellaneous items which consist of a number of individual components built into an assembly by the manufacturers may require additional internal reinforcements to meet Specification 13080 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT.

1.6 THERMAL INSULATION OF MECHANICAL SYSTEMS

Insulation requirements of new mechanical systems, including insulation of plumbing systems and equipment, hot water piping systems, chilled water piping systems and equipment, and the insulation of the duct systems shall meet the requirements of Technical Specification 15080 THERMAL INSULATION FOR MECHANICAL SYSTEMS. Heating piping in heated spaces and conditioned spaces shall be insulated. Hot water piping shall be required to follow tabulated thicknesses. Domestic hot and cold water piping shall be insulated. All ducts shall be insulated in the mechanical rooms and all supply ducts shall be insulated. Cold piping shall have a vapor barrier. High abuse areas shall have aluminum jacket such as janitor closets and mechanical rooms, gymnasiums.

1.6.1 Insulation Covers

Provide reusable insulation covers at all check valves, control valves, strainers, filters, or any other piping component requiring access for routine maintenance. Insulation exposed to the weather or possible physical damage shall be covered by an aluminum metal jacket. All piping with metal jacket shall be identified on the drawings.

1.7 PLUMBING SYSTEM

This Section contains instructions and engineering requirements relating to the design of the new plumbing systems as required. A plumbing system consists of the domestic hot and cold water supply distribution system to the various plumbing fixtures with isolation valves; make-up water piping to the various hydronic type environmental control systems (i.e., expansion tanks, boilers, etc.); fixtures, and fixture traps; soil, waste, and vent piping; and shall extend from connections within the structure to a point 5 feet (1.5 meters) outside the structure. The design of all plumbing systems shall, unless otherwise stated herein, comply with the most current Uniform Plumbing Code and shall meet the requirements of Technical Specification 15400A PLUMBING, GENERAL PURPOSE. Traps for lavatories, and sinks shall be chromium-plated, adjustable-bent tube, 20-gauge brass, where exposed and no cleanouts. All backflow preventers shall be installed for accessibility per guide specification and shall comply with the requirements of the Department of Environmental Quality (DEQ) of the State of Colorado. State licensed plumbers shall install and/or test backflow preventors and cross connections devices. For Fire Protection backflow preventor requirements see Section 01008 FIRE PROTECTION REQUIREMENTS. Lead content in the water distribution system (including in-line devices) shall comply with SDWA of 1998 with amendments and ANSI/NSF 61, section 8. In-line devices shall include water meters, building valves, check valves, meter stops, valves and fittings and backflow preventors. Soil piping does not require any cathodic protection. Sleeves through slab-on-grade floors

shall be provided as shown in detail attached.

a. Provide a water softener for the water service to the humidifiers in the building. The water softening system shall be as specified in Section 11250A WATER SOFTENERS, CATION-EXCHANGE (SODIUM CYCLE). A water analysis shall be done by the Contractor.

1.7.1 Water Service Entrances

New water service entrance lines shall be installed below the recognized frost line 3 feet 2 inches (960 mm) below ground and enter the buildings through the mechanical room floors. New water service entrances shall be provided with a positive displacement type water meter up to and including 2 inch (50mm) and a turbine type water meter for greater than 2 inch (50mm), a pressure reducing valve and a reduced pressure principal backflow preventer with isolation valves located inside the building. Meters shall be provided with a direct non-resettable, digital readout. Meters shall have a pulse switch initiator capable pulse output of operating up to speeds of 500 pulses per minute with no false pulses and shall require no field adjustments or 4-20 mA output. Initiators shall provide the maximum number of pulses up to 500 per minute that is obtainable from the manufacturer. Meters shall be connected to the EMCS system. Meter is required in accordance with Air Force ETL 94-2.

1.7.2 Piping Runs

Piping runs in buildings shall be arranged to not interfere with movement of personnel and equipment. Neither water nor drainage piping shall be located over electrical equipment or panels. Domestic water piping located outside of mechanical equipment areas shall be routed in the ceiling space above the corridors. Water and waste piping shall not be located in exterior walls or other spaces where there is danger of freezing except for wall hydrants. Where piping is to be concealed in wall spaces or pipe chases, such spaces shall be checked to insure that clearances are adequate to properly accommodate the piping. Water piping shall be designed not to exceed a velocity of 6.0 fps (2.4 meters per second) at full flow.

1.7.3 Pipe Materials

Table I in Technical Specification 15400A PLUMBING, GENERAL PURPOSE identifies available material alternatives for above/below ground soil, waste, and vent. Materials for domestic hot, hot water recirculating and cold water distribution systems shall be copper. All piping 2 inch (50 mm) and smaller shall be soldered using 95/5 tin antimony solder, piping 2-1/2 inches (65 mm) and larger shall be brazed. Multi-flame torch is not required for soldering or brazing. Underground water service, sanitary, waste, drain and vent shall be plastic. The Tables shall be edited to indicate which materials shall be used for installation of each system.

1.7.4 Protection of Water Supplies

Cross connections between water supply piping and waste, drain, vent, or sewer piping are prohibited. Reduced pressure type backflow preventers shall be provided on all make-up water systems.

1.7.5 Fixtures

Plumbing fixtures shall conform to ASME standards and Executive Order 12902 with lead-free faucets. End-point devices shall meet lead leaching

requirements of ANSI/NSF 61, section 9, ie. lavatory faucets, kitchen and bar faucets, residential ice makers, supply stops and end point control valves). In-line devices do not have to meet section 9 (ie. bath and shower valves, all drains, backflow preventors). Work shall consist of but not be limited to the following. Coordinate location with the architectural plans. See also, paragraph FOOD SERVICE EQUIPMENT.

a. Washer and dryer hookups see paragraph WASHER CONNECTIONS & LAUNDRY ROOM EXHAUST.

b. Electric water coolers located near all rest room entrances, located outside the gym, group exercise rooms, and within fitness equipment rooms.

c. Floor-mounted Janitor sink in Janitor's closet.

d. Waterless urinals shall not be allowed; maintenance is required to the trap once every 6 months.

e. Water conservation fixtures (low flow type) with automatic metering devices conforming to the Technical Specification 15400A shall be provided in all restrooms.

1) Automatic operating hard-wired electronic sensor solenoid-operated flush valves shall be provided for urinals in the Men's Toilet. Automatic operating hard-wired electronic sensor faucets shall also, be provided in the Men's & Women's Toilets. Battery-operated sensors shall not be allowed. Hard-wired electronic sensors shall be provided with emergency pushbutton for maintenance. Lavatory faucets shall mix hot and cold water and deliver (105°F)(40.5°C) water.

f. Showers in Men's and Women's Toilets/Locker Rooms including area for the handicapped.

g. Laundry sink in the Laundry next to washer and dryers.

h. Provide a dry-type (no steam) sauna in each sauna room, requirements as follows:

Provide large sauna package 12'x8'x7' (3,636 mm x 2,424 mm x 2,121 mm) including the following:

1. Tongue and groove for finished prefabricated walls and ceiling, white or western red cedar, fully insulated, and included with a foil vapor barrier.

2. Interior and exterior trim.

3. Three pre-built benches with commercial style 2"x2" (51 mm x 51 mm) top and bottom screwed and fastened with stainless screws.

4. Insulated pre-hung cedar sauna door with window.

5. Buckboard grating for walking area inside sauna and trim.

6. Ventilation system built-in. Provide natural ventilation that allows air to flow freely from the inlet and outlet, located on opposite walls at approximately the same height. Provide manual louvers to adjust the flow of air from the inside of the sauna, and consider using outside air to supply the sauna.

7. 4500 watt 220 volt sauna heater with built-in controls

and rocks.

8. Bucket, Dipper, Wall light and thermometer. Provide convection heater, stone bed, and heat enclosure. Provide a heat-sensing device 12 inch (300 mm) below the ceiling of the sauna.

9. Provide for a time clock, securable thermostats and an alarm for duress which sounds at the Control Desk.

i. Sink shall be provided in massage room.

i. **HAWC Area BID OPTION - Garbage Disposal**

Garbage disposal shall be provided in sink in kitchen (vegetable sink) and shall conform to commercial standards, continuous feed, minimum 1/2 hp heavy duty motor, corrosion resistant grinding elements, two 360-degree stainless steel anti-jam swivel impellers, manual motor reset, and sound insulation. A plug connector may be required.

j. **Pool Area BID OPTION -** Provide two underground 800 gallon (3,031 liter) 39 Jets Hydro-therapeutic whirlpool/spa in pool area; recessed. Two different temperatures shall be provided; one (102°F)(38.8°C) (adjustable) and one conventional (105°F)(40.6°C)(adjustable). Overall dimensions shall be 96 inch x 133 inch x 39 inch (2438 mm x 5067 mm x 991 mm). The following spa system jets shall be provided:

- 4 Neck jets
- 4 maxi flow jets
- 5 maxi swirl jets
- 1 Master/massage jet
- 1 On/Off Tornado jet
- 2 Whirlpool jets
- 1 Jumbo jet
- 18 Accu-therapy jets
- 1 mini jumbo jet
- 2 micro Flow jets
- 2 Divertor valves

1.7.6 Janitors Closet Sinks

A enameled cast iron floor mounted type service sink shall be provided in all janitor closets. Overall sink dimensions shall be approximately 28 inch x 28 inch (700 mm x 700 mm). The depth of the floor sink bowl shall be approximately 10 inch (250 mm). Sink faucets shall be provided with hose connection.

1.7.7 Electric Water Coolers

Bi-level, accessible or barrier-free, Mechanically refrigerated electric water coolers shall be located near restrooms, located outside the gymnasium, group exercise rooms and within the fitness equipment rooms, with part of each suitable for use by the physically handicapped. Bottom spout unit shall be 28 inches (675 mm) above finished floor. Spout shall be 34 inches (860 mm) above finished floor. The push bar shall be front or front and side mounted. Single mechanically refrigerated electric water coolers shall not be permitted. Cooler shall be lead-free and use CFC-free refrigerant R-134a. Unit shall provide a minimum of 8 gph (0.6 L/s at (50°F)(10°C). Coolers shall be certified to meet ANSI/NSF 61, Section 9

and meet lead leaching requirements of section 9.

1.7.8 Water Hammer Arresters

Commercially available water hammer arresters shall be provided at all new quick closing valves such as solenoid valves and will be installed according to manufacturers recommendations. Vertical capped pipe columns are not permitted. Also, a water hammer arrestor is required for the valve on the pool fill line.

1.7.9 Not Used

1.7.10 Laundry Room Utility Sink/Faucet

A utility sink shall be provided in the laundry room. The sink shall be wall mounted, industrial grade, seamless, one piece, high impact molded fiberglass construction, or white enameled cast iron. The overall sink dimensions shall be approximately 28 inch x 24 inch (700 mm x 600 mm). The sink shall have an extra deep bowl; minimum of 13 inch (325 mm) deep.

1.7.11 Wall Hydrants

Exterior freeze-proof wall hydrants with vacuum-breaker-backflow-preventer shall be located on outside walls at 100 feet (30 m) intervals of the facility. A wall hydrant shall be provided near all Mechanical Room exterior doors. Exterior wall hydrants shall be mounted 36 inch (600 mm) above finished grade.

1.7.12 Wall Faucets

An interior wall faucet shall be provided in all Mechanical Rooms. Wall faucets shall be mounted 36 inch (900 mm) above the finished floor.

1.7.13 Lawn Irrigation

An automatic lawn sprinkler irrigation system shall be provided for the sodded lawn and landscaped areas of the Fitness Center as indicated on Site plans. Design requirements for the sprinkler irrigation system is defined in the Section 01002 Site Work. A reduced pressure principal backflow preventor with isolation valves located in the heated mechanical equipment room (reference paragraph MECHANICAL EQUIPMENT ROOM LAYOUT REQUIREMENTS) shall be provided in the supply line to each lawn irrigation system in order to protect the domestic water system in the building from the lawn irrigation system. Piping within 5-feet (1.25 meter) of the building shall be in accordance with Guide Specification 15400A.

1.7.14 Emergency Shower/Eye Washes

Emergency Shower/Eyewashes shall be provided in pool equipment room and pool storage room. Emergency showers/eyewashes shall be provided at locations required by ANSI Z358.1-1998. This shall include a shower/eyewash every 10 seconds of travel or 100 feet (30 meters) from a hazard and where the hazard is caustic or acidic the distance should be less than 10 feet (3 meters).

Each eyewash and combination shower/eyewash shall be equipped with a mixing valve station located next to unit.

All units shall be connected to the building plumbing system.

Mixing Valve Stations

a. Station shall be constructed to thermostatically control the mixing of hot and cold water and to deliver tempered water at a desired temperature regardless of pressure or input temperature changes. Station shall be a thermo-mechanical system with thermally activated and pressure-activated safety features that do not require electricity for operation. Outlet temperature shall be adjustable 59 to 84.2 deg F (15 to 29 degrees C.) and shall be initially set at 69.8 deg F (21 degrees C.) Station shall be equipped with 1-1/4" (32 mm) inlet and outlet manifold piping with associated isolation valves, unions, strainers on inlets, checkstops, vacuum breaker, outlet temperature gauge, bypass valve, mixing valve, temperature adjustment knob, and etc.. Station shall be factory assembled & tested in a cabinet enclosure

b. Safety features shall include: 1) a pressure relief cold water bypass of the main mixing valve that protects against constricted flow of either hot or cold water; 2) scald protection including a high temperature limit control valve (set @ 84.2 deg F (29 degrees C.) non-adjustable that modulates incoming hot water; and 3) the high temperature valve opens to provide tempered water when there is a unregulated flow of cold water (pressure relief valve is operating) at hot water heater.

1.7.15 Service Stop Isolation Valves

For normal maintenance or replacement, servicing stop isolation valves shall be installed in water connections to all installed new equipment and new fixtures. In addition, stop valves shall be provided to isolate portions of systems so as to not require shutdown of entire systems. Stop isolation valves for piping and equipment shall be shown on the drawings. Service stop isolation valves to faucets shall meet ANSI/NSF 61, section 9 lead leaching requirements.

1.7.16 Floor Drains

A floor drain shall be provided in all mechanical rooms, toilet rooms, shower drying areas, juice bar and janitors closets. To prevent traps from drying out, deep seal traps shall be provided on all floor drains located in areas other than mechanical rooms. AHU condensate and humidifier condensate floor drains shall not be provided in racquet ball courts, gymnasium or in wood floors.

1.7.17 Cleanouts

On straight runs of pipe, cleanouts shall be provided at not more than 50 feet (15 m) apart. Cleanouts shall be provided at each change of direction of pipe and shall be provided at the base of all storm, soil, waste, and vent stacks.

1.7.18 Plumbing Vents

Where feasible, combine circuit vents in a concealed space to a main vent through the roof in lieu of an excessive number of individual vents through the roof. All vent lines through roof shall be 4 inch (100 mm) and terminate a minimum of 6 inch (150 mm) above finished roof. Where vents connect to horizontal soil or waste lines, the vent shall be taken off so that the invert of the vent pipe is at or above the centerline of the horizontal soil or waste pipe.

1.7.19 Duct Drainage

Outside air intake louvers and louvered penthouses shall be ducted and shall have provisions to dispose of melted snow and wind-blown rain which enters through the louvers. The duct seams shall be sealed watertight brazing is required and a drain provided at the duct low point. The drain shall be routed to a floor drain. Duct access doors shall be provided near the louvers.

1.7.20 Domestic Hot-Water

Domestic water heaters (140°F)(60°C) shall be located in the mechanical room and adequately sized to deliver (140°F)(60°C) water. New heaters shall be gas fired with a combined water storage tank. The capacity of the water heaters shall be adequate to meet the peak hot water requirements of the facility and shall be designed in accordance with Chapter 48, Service Water Heating, of the 1999 ASHRAE HVAC Applications Manual. An inlet water temperature of 39.2°F)(4°C) shall be used for sizing the water heater. Minimum efficiency shall be 80 percent for gas-fired type. Water storage temperature shall be minimum (131°F)(55°C) to prevent bacterial growth within the tank. Provide (110°F)(43.3°C) hot water at lavatory electronic sensor type faucets by using mixing valves and (125°F)(51.7°C) hot water at showers by using mixing valves. Where boilers are used in lieu of water heaters they shall meet paragraphs pertaining to hot water heating boilers. A low water cut-off shall be provided.

a. One water heater(s) shall serve the Men's Locker area etc. and one the Women's Locker area etc.. Water heaters shall be provided in mechanical rooms. Water heater capacity shall be equal to the maximum demand of all fixtures operating. A third water heater(s) shall be sized for laundry use and laundry utility sink. Water storage temperature shall be (140°F)(60°C).

Pool Area BID OPTION - A dedicated water heater shall be provided for each whirlpool.

1) Domestic Water Heater Vents

Domestic water heater vents shall be type "B", and shall conform to UL 441. Boiler stacks and domestic hot water vents shall not be tied together. Height of vents shall be as required by NFPA 54 and shall be provided with a rain cap. Also, see paragraph Vents and Stacks.

b. **Contractor alternative design** - Active solar water preheating of domestic hot water shall be considered. A Feasibility Study (SOLFEAS) or LIFE CYCLE COST ANALYSIS (LCCA) is not required. However, a SOFEAS analysis is required to determine the collector sizing and array. Active solar water preheating shall be an indirect (closed-loop) water heating system with 30% propylene glycol and drain back system per ASHRAE 1999 HVAC APPLICATIONS, Chapter 32 and section 13600A SOLAR SYSTEM EQUIPMENT. Direct water heating systems, thermosiphon water heating systems, and drain down water heating systems shall not be used. System shall be provided with two pumps, a heat exchanger, and an expansion tank. Provide the following on the drawings:

1) Solar Collector Array:

- a. SOLFEAS result for minimum array size.
- b. Total array size to be installed.
- c. Bank size (ie. 4 foot (1.2m))(4, 5, 6, or 7 collectors) and number

of banks.

- d. Minimum row spacing in event of multiple rows of collection.
- e. Array orientation with respect to true south.
- f. Reverse-return strategy is important to proper array operation.
- g. Pipe pitch for draining.
- h. Flow rate through collector loop based on recommended flow per collector.

2) Solar Collector Construction (flat plate, liquid, internally manifolded type):

- a. Number of collectors.
- b. Gross area and net aperture area.
- c. Collector height and width.
- d. Collector fluid volume.
- e. Collector filled weight.
- f. Collector manufacturer's warranty period.
- g. Recommended collector flow rate.
- h. Pressure drop across the collector at recommended flow rate.

3) Supports for Solar Collector Array:

- a. For the majority of solar projects, this structure will be constructed as a support rack on a flat roof.

4) Storage Tank:

- a. Storage tank volume should be between 1.5 to 2 gallons per square foot (61 to 81 liters per square meter) of collector area.
- b. Identify minimum R-value of tank insulation.
- c. Identify type of lining in tank.

5) Heat Exchanger:

- a. Type of heat exchanger shell-and-tube or multiplate or plate-and-frame heat exchangers are allowed with an effectiveness of greater than 0.5.
- b. Identify flow rates on both sides of heat exchanger. Flow rate on the storage side of the heat exchanger should be 1.25 times that on the collector side.
- c. Identify plate or tube heat transfer area.

6) Expansion Tank:

- a. This expansion tank sizing requires the expansion tank be able to accept an amount of fluid equal to the fluid volume of the collectors plus piping at the same height or above the collectors. This is in contrast to the conventional method of sizing the expansion tank to account for thermal expansion of the heat transfer fluid.

7) Heat Transfer Fluid:

- a. USP/food-grade uninhibited propylene-glycol is a nontoxic, noncorrosive fluid used by the food industry. Use with distilled water solution.

8) Overall System Operations:

- a. Contractor shall demonstrate that the solar energy system will

operate properly while unattended for a period of at least 72 hours.

c. Not Used - Active solar water heating of pool hot water was considered but, not feasible due to freeze protection required. Also, not standard with the industry for pool heating designs.

1.7.20.1 Domestic Hot Water Re-circulation System

Domestic hot water recirculating pumps shall be provided for each water heater. Pump sizing shall be in accordance with simplified pump sizing method 1995 ASHRAE Applications Manual unless specific conditions warrant the need for more detailed calculations. The system shall continually circulate domestic hot water in order to insure that domestic hot water is available at each fixture without delay. The domestic hot water recirculating pumps shall be all bronze for long life. A clock or other automatic control will be installed on domestic hot water circulation pumps to permit operation only during periods of occupancy plus 30 minutes prior.

1.7.21 Storm Drain System

Where required by the architectural drawings, roof drains, with auxiliary overflow drains, shall be provided at the low points of the roof. Storm water shall be routed through exterior downspouts and piped directly to the facility storm system where required. Roof drains shall be designed for a maximum rainfall rate of a 100-year return with a 15-minute duration per National Standard Plumbing Code and shall be sized in accordance with the National Standard Plumbing Code. All elbows for the storm drainage and overflow drainage piping 10 inches (250 mm) and smaller shall have 90 degree short sweep elbows.

1.7.22 Cathodic Protection

Cathodic protection shall be provided for any new underground metallic piping, fittings, and valves except cast iron soil pipe. Design of cathodic protection system shall in accordance with Section 01007 ELECTRICAL REQUIREMENTS, paragraph entitled "Cathodic Protection".

1.7.23 Washer Connections

Washer Connection - Drainage and hot and cold water supply shall be provided for the automatic clothes washers. Washer connection, complete with 2 inch (50 mm) drain, 3/4 inch (20 mm) hose thread supplies, and electrical outlets for both washer and dryer, shall be provided in a standard manufactured recessed wall box with single-face plate. Box shall be constructed of sheet steel and shall have a corrosion-resistant epoxy enamel finish. Boxes shall be mounted 5 feet (1.2 meters) above the finished floor. Finish color shall be painted to match adjacent finishes.

1.7.24 **Pool Area BID OPTION** - Pool Plumbing (Provided only if pool area bid option accepted.)

The pool water system shall consist of a circulating pump with a hair/lint strainer on the inlet, balance tank, backwash pit, high rate pressure sand filters, **water to water heat exchanger**, a sodium hypochlorite (liquid chlorine) based chlorinator, and hydrochlorinatoric acid pH control solution system. The circulating pump circulates pool water returned by the main pool drain and perimeter gutter system to the balance tank, and pumps it through the pressure sand filters before returning to the pool. The high rate pressure sand filters are equipped with a microprocessor

based controller to monitor filter loading, filtration flow rate, and water temperature. **The pool design shall be performed by an experienced pool system designer.**

a. The backwash cycle is automatically actuated based on pressure drop through the filters. During the backwash cycle, the backwash water is directed to the backwash pit in which a submersible sump pump is located. The sump pump pumps the backwash water into the sanitary sewer connection provided inside the backwash pit. The backwash pit and associated sump pump are also, used to drain the pool. The main pool water circulating pump and a filter bypass valve is used to divert the pool water into the backwash pit where the sump pump then pumps it into the sanitary sewer. A bypass line downstream of the sand filters is installed to circulate a specified amount of pool water through the **dehumidification unit** and supplementary **water to water heat exchanger** for pool water heating.

1) Water to water heat exchanger (pool water heater) shall be a counter flow, tube-in-tube type. Water side shall be Type L, cupro-nickel. Pool water heater shall be insulated with minimum 2 inch (50 mm) closed cell foam. If the dehumidifier is located outdoors, pool water condenser shall be equipped with self-regulating electric heat tape for freeze protection if water-cooled is provided.

b. The dehumidification unit is the primary pool water heating source under normal operation. The back-up pool water heating source shall be a **water to water heat exchanger** using building heating hot water.

c. The pool water is also, treated, downstream of the sand filters and bypass water heater line, by a sodium hypochlorite (liquid chlorine) chlorinator and hydrochloric acid solution to maintain proper pH and disinfection control before returning to the pool. A microprocessor based pH control and monitor panel with remote readout capability shall be provided in the pool equipment room to control and monitor pool water pH. The pH control system will be capable of being programmed to perform super-chlorination automatically based on need.

d. All pool water piping shall be schedule 80 PVC for corrosion resistance.

e. The pool volume shall be calculated and used to determine the required re-circulation flow rate based on a six hour turn over rate for water depths greater than two feet, and a two hour turn over rate for water depths two feet and less.

f. A second pump with hair/lint strainer shall be provided in the pool equipment room to supply the water requirements for the water features in the zero depth area of the pool. The water features require a separate pump so that their water flow requirement does not interfere or detract from the code required re-circulation rate and specific pool water inlet locations and flows.

1.7.25 Pool Area BID OPTION - Pool Water Chemistry (Provided only if pool area bid option accepted.)

Chlorine is the primary pool treatment process, killing germs and destroying harmful organic containment's introduced into the water by bathers. Improperly balanced pool water chemistry can attack the indoor pool's HVAC System and building structural components. Airborne combined

chlorine compounds along with condensate from a liquid that is very corrosive to ferrous metals and stainless steel due to chloride content and acidity.

The dehumidification system will remove the excess moisture from the pool enclosure but it will not eliminate the harmful chlorine compounds that cause the chlorine odor and metal corrosion. The swimming pool's water treatment system shall automatically replenish the free chlorine through the pool's automatic chlorinator to maintain a recommended free chlorine level typically 1.0 to 4.0 ppm. Unchecked the chloramine concentration can rise to unacceptable levels. The "Pool-Spa Handbook" by the National Swimming Pool Foundation recommends chloramine levels not to exceed 0.3 ppm.

A calorimeter shall be provided in the lap pool. Chloramines shall be controlled to below 0.2 ppm with periodic checking by the User. When chloramine level exceeds 0.2 ppm "shocking" shall be provided by the pool system design. Shocking shall intentionally rise the free chlorine level in the pool to 12-15 times the level of the chloramines throughout the entire pool surface. This free chlorine concentration level is the "break point" level. The "Pool-Spa Operators Handbook" include tables that compare the pool size in gallons with the break point free chlorine concentration level. The table will indicate the proper chlorinating agent levels to properly shock the pool.

After shocking the free chlorine level must be lowered to a level acceptable to the local health code for bathing. Additives may be required.

A fan may be used to sweep off the blanket of nitrogen gas formed by shocking over the pool's surface during shocking and assisting in the shocking process. However a 100% outside air purge cycle into the HVAC control system shall be used for shocking.

1.8 EXTERIOR GAS DISTRIBUTION SYSTEMS

This Section contains instructions and engineering requirements relating to the design of the new exterior natural gas distribution system where required, including the building gas service lines and gas service regulator assemblies. The gas distribution systems shall be designed in accordance with NFPA-54, and shall meet the requirements of Technical Specification 02556A GAS DISTRIBUTION. **The exterior gas line shall be sized for the basic plus bid options.**

1.8.1 Service Lines

A new service line shall be provided and connected to the existing 4 inch (100 mm) @ (X psi) (x kPa) line (see utility plan for conceptual routing). The point of connection shall be provided with a another shutoff plug valve, conveniently located outside of any traffic area and protected with a valve box.

- 1) This may necessitate a **base-wide shutdown** of the gas system. Contact Public Service Company (Now Xcel) to coordinate @ (800)-777-7858 or (303) 623-1234.

- 2) Tap into the existing line 4-inch (100 mm) shall be a "hot tap" and the Base Fire Department shall be given 30 days advance notification of the date of the tap (see minimum service line sizing paragraph Service Line Sizing). The existing main is owned the Public Service Company (Xcel). The point of connection shall be provided with a shutoff plug

valve, conveniently located outside of any traffic area and protected with a valve box.

a. Service lines shall not be installed under or routed thru the facility.

Except for piping located at the new gas meter/service regulator assemblies, no aboveground gas piping shall be exposed to view. The service line shall enter the buildings in an accessible location outside the mechanical room areas. The gas meter/service regulator assemblies shall be hidden from view to the greatest extent possible.

b. Service lines to buildings shall run parallel and/or perpendicular to the building lines, shall be buried at least 18 inch (450 mm) below the ground surface, shall not be laid in the same trench with other utilities, and shall be above other utilities whenever they cross. New gas lines shall not be laid under paved streets, parking lots, roads or in other locations subject to heavy traffic whenever practicably avoidable and economically feasible to locate elsewhere. Whenever it is necessary to locate gas lines in such locations, the lines shall be protected by suitable encasement or by burying to a depth to provide at least 5 feet (1.5 meters) of cover over the top of the pipe except that new gas lines shall be provided with encasement when laid under new or existing paved streets, and new parking lots.

c. All manholes, or valve boxes, of any nature within the project that do not conform to the new finish grade in either surfaced or unsurfaced areas shall be adjusted to the new finish grade. Where manholes, or valve boxes fall within a surfaced or unpaved roadway or parking, the existing frames and cover shall be removed and replaced with a heavy-duty frame and cover. The structure shall be adjusted as needed to fit the new conditions. All structures shall be of a type suitable for the intended use and shall conform to the requirements of the applicable section of these specifications

1.8.2 Service Line Sizing

The size of the service lines shall be sufficient to supply the demand without excessive pressure drop greater than 10 percent and shall not be less than 1 inch (25 mm) in size.

1.8.3 Service Line Materials

All new underground service lines shall be polyethylene and all aboveground lines steel.

1.8.4 Service Line Markers

New underground service lines shall be identified by a permanent on grade utilities marker which indicates the type of service and depth of burial. Markers shall be located a maximum of 100 feet (30 m) apart on straight runs and at every change in direction. Markers in high traffic areas shall be protected from physical damage. Markers shall consist of a stamped or engraved brass name plate embedded in concrete. Tracer wire shall be 18 gauge AWWG copper secured to piping at not more than 3 foot (1 meter).

1.8.5 Service Line Protection

New below grade lines shall be protected from physical damage by placing a continuous, detectable plastic ribbon in the trench such that any excavation will uncover the ribbon prior to reaching the line. When

non-ferrous service lines are installed, a foil backed magnetic tape shall be installed above the pipe to permit locating with a metal detector.

1.8.6 Cathodic Protection

Cathodic protection shall be provided for the any underground metallic piping and fittings required for the transition between the underground pipe and the aboveground metallic pipe. Design of cathodic protection system shall in accordance with Section 01007 ELECTRICAL REQUIREMENTS, paragraph entitled "Cathodic Protection".

1.8.7 Gas Meters

A new gas meter shall be provided as part of the new service regulator assemblies. Meters shall be provided with a direct non-resettable, digital readout. Meters shall have a pulse switch initiator capable pulse output of operating up to speeds of 500 pulses per minute with no false pulses and shall require no field adjustments or 4-20 mA output. Initiators shall provide the maximum number of pulses up to 500 per minute that is obtainable from the manufacturer. It shall provide not less than one pulse per 2.8 cubic meter of gas. Meters shall be connected to EMCS. Meter is required in accordance with Air Force ETL 94-2.

1.9 INTERIOR GAS PIPING SYSTEMS

This Section contains instructions and engineering requirements relating to the design of new interior natural gas piping systems. Interior gas piping systems shall extend from the outlet of the gas service regulator/meter assembly to the point of connection of each gas utilization device. The aboveground gas piping system shall be steel designed in accordance with NFPA 54 and shall meet the requirements of Technical Specification 15190A GAS PIPING.

1.9.1 Gas Piping

Piping shall be sized in accordance with NFPA 54 to supply the demand without excessive pressure drop between the point of delivery and the gas utilization equipment. Minimum interior gas pipe size shall be 3/4 inch (20 mm). The calorific value of the natural gas to be used in calculations for sizing equipment and piping is (1000 Btuh) (37,600 KJ per cubic meter). Gas piping shall be shown on the mechanical HVAC Drawings.

1.9.2 Equipment Connections

The final connection to gas equipment shall be made with rigid metallic pipe and fittings. Accessible gas shutoff valve and coupling are required for each piece of gas equipment.

1.10 HYDRONIC HEATING SYSTEMS

Heating system shall be a forced-air/hot water system and/or fin-tube radiation system consisting of a natural gas fired boilers, water distribution system, circulating pumps, (and associated space heating equipment). The heating system shall be capable of providing heat for the building air ventilation systems. The heating water piping system shall be used to circulate hot water to the heating equipment during the heating season as indicated herein. Piping shall utilize reverse-return

configuration. The heating system designs shall meet the requirements of Technical Specification 15569A WATER AND STEAM HEATING; OIL, GAS OR BOTH; UP TO 20 MBTUH and, unless otherwise stated, shall comply with the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Handbooks. The heating system design shall include safeguards to protect against freezing damage. Hot water pipe velocities shall be sized to not exceed 4 fps (1.4 m/s). The entire building hot water system including all piping, equipment and appurtenances, shall be filled with a solution of 50 percent propylene glycol and 50 percent water (by volume). This solution shall be added after all pressure testing and cleaning of piping systems has been satisfactorily completed and prior to testing and balancing of the systems. Required flowrates and head loss shall be corrected for glycol. This corrected flowrates shall be used in selecting all other cooling equipment i.e., heating coils. Pipe sizing friction loss shall be based on 4 feet per 100 foot. maximum and a maximum pipe velocity of 4 fps (1.6 m/s) for piping 2 inch (50 mm) and less.

1.10.1 Boilers

The hot water supply shall be heated to (200°F)(93.3°C) and supplied by natural gas-fired, conventional type boilers rated for a pressure of 30 psia (207 kPa). (NOTE: All boilers shall add up to 100% of the total heating load **basic plus bid options**) Each boiler shall be provided with a forced-draft unless noted otherwise, two position (high-low) burner and shall be interlocked with the hot water pump to provide a continuous flow of hot water to the facility at outdoor temperatures below (65°F)(18°C)(adjustable). The hot water system supply temperature to the space shall be automatically controlled by manufacturer's standard controls. The boiler shall be interlocked with the heating water circulating pumps, through the control system, such that the boilers burner can not fire unless a pump is running. The boiler shall have a minimum efficiency of 80 percent consideration shall be given to the use of a minimum efficiency 90 plus percent boiler. If a high efficiency (condensing type) boiler is provided, to meet high efficiency requirements, the hot water shall be supplied at a lower temperature ie. (140°F)(60°C) and returned at (120°F)(48.9°C). All heating coils, pumps, and hot water heating equipment shall be sized an selected for these temperatures to ensure all equipment is sized larger to take into account the lower return temperature upon which these boilers are normally selected. The use of a natural draft boiler shall be allowed if the minimum efficiency of 80 percent can be met at the site elevation and boiler is less than (1,000,000 Btuh) (3413Kw). Boiler reset shall be (200°F)(93.3°C)@ (0°F)(-17.7°C) & (150°F)(65.5°C) @ (72°F)(22.2°C)

1.10.1.1 Boiler Connections

Design of boiler connections and auxiliary equipment shall conform to the requirements of ASME Boiler Code.

1.10.1.2 Low-Water Cutoffs

Float-type safety water feeders with low water cutoffs shall be provided for the hot-water boilers.

1.10.1.3 Water Column Connections

Provide crosses at right-angle turns on water column connections to boiler.

1.10.1.4 Smoke Connection

Boiler flue stack connections shall be in accordance with NFPA 211. Also, see paragraph Vents and Stacks.

1.10.1.5 Boiler Flue Termination

The boiler flue shall extend up through the roof of the building. The flue shall be provided with a rain cap fitting.

1.10.1.6 Boiler Location

The boilers and all associated fuel burning equipment shall be located in the west mechanical room.

1.10.2 Heating Water Circulating Pumps

The heating water shall be circulated by two base mounted, end-suction, centrifugal pumps with mechanical seals. Each pump shall be sized for 100 percent of the maximum required heating water flow and 100 percent of the maximum system head pressure. The pumps capacity shall be based on a (200°F)(93.3°C) supply and (180°F)(82.2°C) return water. The pumps shall be non-overloading allowing the pump to operate at any point on its characteristic curve. Each pump shall be provided with a suction diffuser and mounted on a 6 inch (150 mm) thick concrete housekeeping pad. Each pump shall be provided with a calibrated bronze balancing valve. Pumps shall run at temperatures below (65°F)(18.3°C). If one pump should fail, the other stand-by pump shall start (providing 100% of the full flow capacity). Pumps shall alternate starting and have run-time meters. Pump flow rate (and head loss) shall be corrected for glycol. This corrected flow rate shall be used in selecting all other equipment ie. coils.

a. Pump Control

The boiler circulation pumps shall start and stop with their respective boilers. A flow switch in the heating water return line to each boiler in the production loop shall allow the boiler to fire, only after flow has been established through the boiler. The heating water distribution pumps shall be controlled to run in a lead-lag configuration when the outdoor air temperatures is below 60 degrees F. (15.6 degrees C.), so that only the lead pump shall operate.

1.10.3 Expansion Tanks

A bladder type expansion tank shall be provided in the heating hot water piping systems. The expansion tanks precharge pressure and acceptance volume shall be selected based on the layout of the piping systems.

1.10.4 Air Separation Tanks

The heating hot water piping systems shall be provided with an air separation tank. The air separators shall include an automatic air vent and make-up water system, consisting of a pressure reducing valve, strainer, reduced pressure type backflow preventer and isolation valves.

1.10.5 Water Treatment Systems

Provide a mixture of 50% propylene glycol and 50% water into the primary loop of both the heating and cooling systems. Provide a shot feeder (chemical feeder) at the heating water distribution pumps to allow

introduction of chemicals into the system. Provide the chemical treatment necessary to protect the heating system's equipment from damage due to corrosion and freezing. Automatic glycol feeder when provided will allow Contractor to not provide air separator accessories.

1.10.6 Air handling Unit Coils

Air handling unit's coil shall be as follows:

- a. Each air handling unit coil shall be provided with a three-way control valve.
- b. Leaving air temperatures for heating coils (except for preheat) shall be between (100-105°F)(38-41°C).
- c. Coils shall be selected with no more than 514.6 fpm (3 m/s) coil face velocity.

1.10.7 Variable Air Volume Box Reheat Coils

Each VAV Box shall be provided with a three-way control valve. Leaving air temperatures for reheat coils shall be a minimum of (105°F)(40°C) at 40% of maximum flow rate. Heating shall be provided with volume damper at minimum of 40% maximum cooling flowrates.

1.10.8 Piping

All piping shall be pitched up in the direction of flow, shall be designed without pockets which would permit accumulation of air, and shall be provided with vents at high points and drains at low points. Piping located outside of mechanical equipment areas shall be routed in the attic or in the pipe chases.

1.10.8.1 Pipe Materials

All new heating water piping within the facility shall be black steel conforming to ASTM A53, Schedule 40 or copper.

1.10.8.2 Pipe Joints

Heating water pipe joints shall be of the following types:

- a. Heating water piping installed within the facility shall utilize threaded joints or welded joints. Welded joints and fittings shall be used for joints 2 1/2 inch (65 mm) and larger. Copper pipe joints 2 1/2 inch (65 mm) and larger shall be brazed. Grooved mechanical joints shall not be used.
- b. Connections to equipment shall utilize unions for pipe 50 mm and smaller and flanges for pipe 2 1/2 (65 mm) and larger.

1.10.8.3 Pipe Expansion

In runs of pipe 50 feet (15 meters) and longer, or in shorter runs where designer deems it is required, indicate size on project drawings the location of all anchors, bends, loops, and pipe guides to adequately limit and provide for pipe expansion. Do not use expansion joints in piping unless absolutely necessary and justified. Anchors and guides shall be indicated on the project drawings and detailed for installation in the

building structure provided. The STRUCTURAL DESIGN ENGINEER shall be thoroughly informed of all forces generated.

1.10.9 Vents and Stacks

Stacks shall be in accordance with NFPA 211. Generally all stacks will be of the prefabricated type with individual stack provided for each appliance. Stacks are generally used for forced draft applications. Vents shall conform to UL 441 and be Type B. Vents are generally used for atmospheric burners only. Vents can be tied together to a main vent. Combined stacks shall not be used for appliances with power burners or draft fans. Stacks and vents can not be tied together. Height of stacks and vents shall be as required by NFPA 54 and shall be provided with a rain cap.

1.10.10 Mechanical and Electrical Equipment Rooms

The mechanical and electrical equipment rooms shall be provided with a thermostatically controlled, hot-water, horizontal throw unit heaters to maintain a space temperature of (45°F)(7°C) minimum. The unit heater airflow shall be directed toward the combustion air intake(s) in order to warm the combustion air where required. This shall not apply to the Communication Equipment room which shall be mechanically-cooled.

1.10.11 Not Used

1.10.12 Fin tube

Fin tube shall be provided for perimeter heating in exterior facing storage rooms, stairs and vestibules. Where used, the mounting height of radiators shall be coordinated with installation of electrical outlets to prevent any interferences. Radiators shall be of the commercial, architectural, rectangular, top outlet type with extruded anodized aluminum grille and key operated damper. Radiator enclosures shall be 16 gauge steel with baked enamel finish. Individual, self-contained, thermostatic control valves shall be provided for each radiator.

1.10.13 Not Used

1.10.14 Unit Heaters

Thermostatically controlled, hot water unit heaters are permitted in non-administrative areas, mechanical room, and electrical room in addition to the air handling units that are required for outside air. Unit heaters shall cycle on and off to maintain setpoint. Ceiling suspended type cabinet unit heaters shall be provided near all administration. area exits. Thermostats shall be wall mounted.

1.10.15 Electric Resistance Heating

The use of electric resistance heating is not permitted.

1.11 HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS

This Section contains instructions and engineering requirements relating to the design of the new HVAC supply and distribution systems. The design of all systems shall comply with the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Handbooks, to the

requirements of NFPA Standards Nos. 90A and shall meet the requirements of Technical Specification 15895A AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEMS. Mechanical ventilation and ventilation requirements for occupants shall provide the minimum outdoor air supply rates for occupants in heated or air-conditioned facilities, or both, required by ASHRAE Ventilation Standard 62.

a. Air distribution systems shall be designed to prevent infiltration at the anticipated prevailing wind.

b. Design of variable air volume systems shall ensure proper ventilation rates at low and high system air flow by providing constant volume of outside air. Cooling shall be produced by mechanical ventilation and air conditioning.

c. Equipment capacities and flows shall be corrected for altitude on drawings (schedules).

d. The use of gas-fired "unit heaters & air-handling units" is not permitted.

e. Noise Criteria unless otherwise indicated is as follows:

i. Noise and Room Criteria (see ASHRAE 1999 APPLICATIONS) unless otherwise indicated is as follows:

1. Mechanical Equipment rooms	= 60 NC (max)
2. Gymnasium	= 50 RC(N)
3. Aerobic rooms	= 40 NC (max)
4. Weight rooms	= 40 NC (max)
5. Cardiovascular rooms	= 40 NC (max)
6. Racquet ball courts	= 40 NC (max)
7. Administrative/Office areas	= 35 RC(N)(max)
8. Lobby/Toilets/Corridors	= 45 RC(N)(max)
9. Conference rooms	= 35 RC(N)(max)
10. Libraries	= 40 RC(N)
11. Classrooms	= 40 RC(N)(max)
12. Food Demonstration	= 45 RC(N)
13. Private Offices	= 35 RC(N)

1.11.1 System Designs

All spaces in the facility except for janitor closets and interior storage shall be heated and cooled by mechanical ventilation or air-conditioning as indicated.

a. Vestibules, stairs, etc, shall be heated for freeze protection of sprinklers only (or Mechanical design shall be coordinated with the Fire Sprinkler Installation for freeze protection).

b. Ventilation in rest rooms/lockers, storage, laundry and janitors shall be for odor exhaust only and shall be interlocked with AHU relief dampers. Building shall be maintained at a positive pressure when operating. Excess outside air shall first be relieved through areas generating odors (such as toilet rooms & lockers) then through relief louvers.

c. Unheated or air conditioned closets and storage areas in air-conditioned facilities shall be provided either directly with air

conditioned air or provided with exhaust to transfer conditioned air to adjacent spaces.

d. Suspended air handling units, and heating and ventilating units not located in mechanical rooms shall be on platforms or catwalks with perimeter railings for maintenance access. Railings shall be in accordance with OSHA requirements.

e. Heating and ventilation for racquet ball courts and gym may be provided by suspended air handling unit(s) in the gymnasium.

f. Heating and ventilation air for other areas shall be provided by air handling units located at the following locations:

1. Variable air volume AHU-1 in West Mechanical room& (AHU-3 - **Mechanical room 140 BID OPTION**) in East Mechanical Room.
2. Single-zone variable volume AHU-2 in West Mechanical Room.
3. Constant volume AHU-4 suspended in Gym & AHU-5 in Mechanical Room.
4. FCU-1, FCU-2's, FCU-3 -, FCU-4, FCU-5, FCU-6 suspended in Large group exercise room, small exercise room(s), resistance weights - training - **Weight room 139 BID OPTION**, free weights - **Weight room 139 BID OPTION**, Cardiovascular room.
5. Dedicated Pool **dehumidification/heating/cooling unit - Pool Area BID OPTION**.

1.11.2 Air Handling Units

1.11.2.1 AHU Systems in Administration area, Laundry, Men's & Women's Toilet/Locker Rooms, etc.

AHU-1 in Mechanical Room serving the administrative area, Men's & Women's Toilet/Locker rooms, Laundry room, etc. shall be a modular type draw thru unit equipped with a hot water pre-heating coil, chilled water cooling coil, and a combination filter/mixing section. An in-line return fan and relief louvered penthouse shall be provided for use of 100 percent outside air ventilation during economizer mode. The mixed air dampers shall modulate to maintain the mixed air temperature set point and the relief air dampers shall modulate to maintain a slightly positive building pressure, in response to the economizer thru the DDC. An intake louver shall be provided on an outside wall and shall be ducted to the top of the AHU mixing box section. The pre-heating operation shall be capable of supplying the minimum outside air required at a constant discharge temperature and shall be selected with no more than 514.6 fpm (3 meters/second) coil velocity. Minimum outside air shall be relieved thru toilet/locker exhausts. The AHU in west mechanical room shall be a variable air volume system. The VAV air handling unit shall provide a variable volume of primary air, at a constant temperature, to VAV terminal units in the air handling system. The speed of the supply fan shall be modulated by a variable frequency drive to maintain a constant pressure in the air distribution system. Discharge air reset shall be provided. (ie. DAT = (55°F)(12.8°C) @ RAT is greater than (78°F)(25.6°C) and DAT = (65°F)(18.3°C) @ RAT is less than (70°F)(21.1°C). The speed of the return air fan also, shall be modulated by a variable speed drive to track the supply fan and to maintain building at a slightly positive pressure. Air flow stations on the return and supply air ducts to and from the return and

supply air fans shall enable the return fan to track the supply fan. An air flow station/controller shall be provided in the outside air duct to the air handling unit filter/mixing section to provide and maintain minimum outside air requirements. Economizer mode shall be disabled at temperatures above high limit and outside air damper returned to minimum position. When the economizer is inactive, the mixed air and relief air dampers shall be at their normal positions, in order to provide the minimum ventilation requirement which is exhausted through the toilet/locker exhausts. Mixed air reset shall also, be provided. (ie. MAT = (52°F)(11.1°C) @ RAT = (78°F)(25.6°C) and OAT greater than (65°F)(18.3°C) @ RAT less than (65°F)(18.3°C). In order to provide this minimum ventilation air a constant volume supply fan may provided to maintain constant ventilation air to the VAV air handling unit system in lieu of outside air flow measurement station/controller. The VAV box minimums shall be set to maintain the AHU minimum ventilation rate for a fully occupied facility. During unoccupied hours and warm-up mode, the mixed air dampers shall be positioned for 100 percent re-circulation and the relief air damper is closed. Each temperature control zone is to be served by a VAV terminal unit (this is to include each room identified on the Architectural plans to be air-conditioned and heated) which modulates the quantity of primary air supplied to each room with pressure independent controls, to maintain the temperature set point. When the damper in the VAV terminal unit closes to the minimum position, and the room temperature continues to drop, a control valve on the VAV terminal unit heating coil modulates open to maintain the room temperature set point. During the unoccupied and warm-up modes of operation the VAV terminal unit dampers are at minimum position, and the VAV terminal unit heating valves are open. The air handling unit supply and return fans cycle to maintain the set back room temperature and to warm-up the rooms to the occupied heating set point during the warm-up mode of operation.

1.11.2.2 AHU Systems Gym/running track

AHU Systems Gym/running track

a. AHU-2 in mechanical room shall be a modular type draw thru unit equipped with a hot water heating coil, chilled water cooling coil, packaged humidifier and a combination filter/mixing section. Relief louvered penthouse shall be provided for use of 100 percent outside air ventilation during economizer mode. The mixed air dampers modulate to maintain the mixed temperature set point and the relief air damper modulates to maintain a slightly positive building pressure, in response to the economizer thru the DDC. An intake louver shall be provided on an outside wall per force protection requirements and shall be ducted to the top of the AHU mixing box section. The heating operation shall be capable of supplying the minimum outside air required at a constant discharge temperature and shall be selected with no more than 514.6 fpm (3 meters/second) coil velocity. Minimum outside air shall be relieved thru relief dampers. The AHU-2 shall be a single zone variable air volume system. The VAV air handling unit provides a variable volume of primary air, at a constant temperature, to the air handling system. The speed of the supply fan shall be modulated by a variable frequency drive to maintain a constant pressure in the air distribution system. Discharge air reset shall be provided. (ie. DAT = (55°F)(12.3°C)@ space temperature of (78°F)(25.6°C) and DAT = (105°F)(40.6°C) @ space temperature of (70°F)(21.1°C). The outside air damper shall be modulated by the DDC to track the supply fan and to maintain building at slightly positive pressure. Economizer mode shall be disabled at temperatures above high limit and return to minimum position. Economizer mode shall be disabled

and go back to minimum outside air whenever the space relative humidity exceeds 60% RH. An air flow station shall be provided in the outside air duct to the air handling unit filter/mixing section to provide and thru a controller maintain minimum outside air requirements. When the economizer is inactive, the mixed air and relief air dampers shall be at their normal positions, in order to provide the minimum ventilation requirement which is exhausted through the relief. Mixed air reset shall be provided. (ie. MAT = (52°F)(11.1°C) @ space temperature of (78°F)(25.6°C) and MAT = (65°F)(18.3°C) @ space temperature of (70°F)(21.1°C). AHU-2 cooling coil shall also, be provided with dehumidification when space RH exceeds 60% RH by modulating cooling coil fully open & reheating to return to 40% - 60% RH range. During unoccupied hours and warm-up mode, the mixed air dampers are positioned for 100 percent re-circulation and the relief air damper is closed. In order to provide this minimum ventilation air a constant volume supply fan may be provided to maintain constant ventilation air to the VAV air handling unit system in lieu of outside air flow measurement station/controller. The VAV box minimums shall be set to maintain the AHU minimum ventilation rate for a fully occupied facility. During unoccupied hours and warm-up mode, the mixed air dampers shall be positioned for 100 percent re-circulation and the relief air damper is closed. Each temperature control zone is to be served by a VAV terminal unit (this is to include each room identified on the Architectural plans to be air-conditioned and heated) which modulates the quantity of primary air supplied to each room with pressure independent controls, to maintain the temperature set point. When the damper in the VAV terminal unit closes to the minimum position, and the room temperature continues to drop, a control valve on the VAV terminal unit heating coil modulates open to maintain the room temperature set point. During the unoccupied and warm-up modes of operation the VAV terminal unit dampers are at minimum position, and the VAV terminal unit heating valves are open. The air handling unit supply fan cycles to maintain the set back room temperature and to warm-up the room to the occupied heating set point during the warm-up mode of gym operation. Condensate shall be ran to restrooms. Economizer shall be deactivated if space relative humidity drops below 40 percent.

1) Occupied mode outside air control: With the system in the occupied mode the DDC system shall monitor the return air oxygen level through an oxygen sensor. The system shall modulate the position of the outside air and return air dampers in order to bring in an amount of outside air that will maintain a return air oxygen level of acceptable rate (adjustable). The minimum outside air setting shall be xxx liters per second based on a minimum of 60 people at 10 L/s. Should the oxygen sensor located in the gym detect an oxygen level of less than 19.5 % the DDC system shall position the outside air and return air dampers for an outside air flow of xxx liters per second (based on the full load of people in the gym) and provide a DDC/EMCS low space oxygen level alarm. When the space oxygen level rises to 23 % or above the control of the outside air and return air dampers shall again be based on the return air oxygen level.

b. AHU-3 Systems in West Mechanical room same as AHU-1 except serving HAWC - **Mechanical room 140 BID OPTION**.

c. AHU-4 System's Serving Racquet ball Courts and exercise rooms shall be provided to ensure ventilation requirements are maintained and humidification is also, maintained. Each area shall have a humidistat and temperature sensor; system shall be controlled by discriminator control.

AHU-4 shall be a modular type draw thru units equipped with a hot water heating coil, chilled water cooling coil, packaged humidifier and a

combination filter/mixing section. A relief louvered penthouse or roof mounted exhaust fan shall be provided for use of 100 percent outside air ventilation during economizer mode. The mixed air dampers modulate to maintain the mixed temperature set point and the relief air damper modulates to maintain a slightly positive building pressure, in response to the economizer thru the DDC. An intake louver shall be provided on an outside wall and shall be ducted to the top of the AHU mixing box section. The heating operation shall be capable of supplying the minimum outside air required at a variable discharge temperature to meet the load and shall be selected with no more than 514.6 fpm (3 meters/second) coil velocity. Minimum outside air shall be relieved thru relief air damper or roof mounted exhaust fan. When the economizer is inactive, the mixed air and relief air dampers or roof mounted exhaust air damper shall be at their normal positions, in order to provide the minimum ventilation air requirement which is exhausted through the relief air dampers or roof mounted exhaust air damper. Space temperature shall control the heating and cooling coil. Mixed air reset shall be provided. (ie. MAT = (52°F)(11.1°C) @ RAT = (78°F)(25.5°C) and MAT = (65°F)(18.3°C) @ RAT = (70°F)(21.1°C). Economizer mode shall be disabled and go back to minimum outside air whenever the space relative humidity exceeds 60% RH or high limit temperature is exceeded. The AHU-4 in gym shall be a constant air volume system. The air handling unit provides a constant volume of primary air, at a variable temperature, to the air handling system. During unoccupied hours and warm-up mode, the mixed air dampers are positioned for 100 percent re-circulation and the relief air damper is closed. AHU-4 cooling coils shall also, be provided with dehumidification when space RH exceeds 60% RH by modulating cooling coil fully open & reheating to return to 40% - 60% RH range. The air handling unit supply fan cycles to maintain the set back room temperature and to warm-up the racquet ball courts to the occupied heating set point during the warm-up mode of operation. Condensate shall be ran to restrooms. Economizer shall be deactivated if space relative humidity drops below 40 percent.

c. To ensure proper ventilation air requirements are provided the following fan coil units with standard filters shall be provided:

(1) Fan Coil Units or air handling units serving Large group exercise room, small exercise room(s), resistance weights - training - **Weight room 130 BID OPTION**, free weights - **Weight room 130 BID OPTION**, Cardiovascular room; FCU-1, FCU-2's, FCU-3, FCU-4, FCU-5. The fan coil unit shall be mounted above the suspended ceiling (if provided). The unit shall be provided with a heating coil, cooling coil, an outside air duct, a motorized outside air damper, a manual outside air balancing damper, a return plenum and supply plenum, if necessary. Fresh air for the room shall be drawn through the unit and mixed with return air from the room. The unit shall be capable of adequately mixing the outside air and return air in order to provide supply air of uniform temperature regardless of whether the coil is operating. Supply air shall be ducted to one or more supply registers as necessary to provide even heating or cooling within the space. The unit shall be insulated to minimize sound transmission to the room. Piping to and from the unit shall be located above the ceiling. The unit shall be accessed by removing the acoustical ceiling panels. The motorized outside air damper shall be interlocked with the fan so that the damper opens only when the supply fan is running. Programmable thermostat shall be provided.

(2) An Alternative to VAV box serving AHU-1:

Laundry Room Fan Coil Unit FCU-6. The Laundry room fan coil unit shall be mounted above the suspended ceiling. The unit shall be provided with a heating coil, cooling coil, an outside air duct, a motorized outside air damper, a manual outside air balancing damper, a return plenum and supply plenum, if necessary. Fresh air for the room shall be drawn through the unit and mixed with return air from the room. The unit shall be capable of adequately mixing the outside air and return air in order to provide supply air of uniform temperature regardless of whether the coil is operating. Supply air shall be ducted to one or more supply registers as necessary to provide even heating or cooling within the space. The unit shall be insulated to minimize sound transmission to the room. Piping to and from the unit shall be located above the ceiling. The unit shall be accessed by removing the acoustical ceiling panels. The motorized outside air damper shall be interlocked with the fan so that the damper opens only when the supply fan is running. Programmable thermostat shall be provided.

1.11.2.3 Self-Contained Packaged Humidifiers

Unit shall be provided for AHU-2, AHU-4's and fan coils or air handling units serving exercise rooms shall be self-contained electrode steam humidifier or gas-fired type. Humidifier assembly shall include a 20-gauge steel cabinet that houses replaceable canister with auto-flush, solenoid fill valve, pressure regulating orifice, and auto control circuit. The humidifier shall be serviceable without disconnecting the high-voltage power supply and shall not interrupt unit operation. Electrode wires shall be connected with quick connect fasteners. **All areas with wood floors shall be provided humidification except saunas.**

a. Microprocessor control shall maintain humidifier operation through fill and drain cycles based on water conductivity. Overflow and loss of flow protection shall be provided along with a manual drain switch. A capacity adjustment potentiometer shall be provided. A high-water alarm with built-in time delay shall provide an audible and visual indication to change canister. Humidifier shall have full modulating control to provide 0 to 100 percent capacity. It must also provide a gradual increase in amperage in order to avoid undesirable surges of current. Humidifier shall be supplied with a solid state electronic sensor controller (humidistat compatible with DDC system to supply 40% - 60% R.H. @ minimum outside air required) capable of fully modulating the steam flow.

b. The humidifier fill waterline shall have an air gap to prevent backflow (or siphoning) of contaminated water into the water supply system. Water fill lines shall also have a water seal between a fill cup and the steam generator to prevent backflow of steam vapor when the drain valve is activated.

c. Humidifier shall incorporate electrical terminals for installation of controlling stat, duct high-limit stat, interlock switch to fan motor and/or to sail switch in duct. Humidifier shall be supplied with a steel steam dispersion-tube which provides uniform steam distribution over the entire tube length and shall be supplied at various lengths to adequately span the widest dimension of the duct. Steam hose from generator to dispersion tube shall be of reinforced rubber to adequately convey steam to the tube and to drain any condensate back to the generator.

1.11.2.4 Pool Area BID OPTION - Pool Area Dehumidification Unit

The unit shall control space temperature and relative humidity, pool water temperature and provide controlled ventilation. Warm moist air from the lap pool is drawn over an evaporator coil by the fan, removing latent and sensible heat from the air. The heat captured by this process and the heat generated from the compressor power consumption are absorbed by a mechanical refrigeration system. Humidity in the pool areas has historically contributed to major maintenance problems. **Manufacturer shall be designed by an experienced pool system designer with at least 10 years of documented experience.** The key to a low maintenance system is to control humidity in the space. The lap pool will be served by a dehumidification unit whose primary function is to control the space temperature and humidity caused by pool water evaporation. The dehumidification unit uses heat pump technology to recover and reuse heat energy extracted from the dehumidifying and cooling the return air, to primarily reheat the supply air to the lap pool. When the recovered heat energy from the return air is not needed for reheating the supply air, the energy is directed to heat the pool water. **The design of the pool's heating air conditioning and ventilation system shall be designed by an experienced pool system designer with at least 10 years of documented experience.** When chilled water is available a chilled water coil shall be factory installed upstream of the supply fan. The coil shall have a factory-installed and wired three-way flow control valve. Dual fan units shall be provided with an economizer.

a. The dehumidification unit shall be provided with a pool water cooled condenser sized to provide the required air conditioning during the cooling season. The heat rejected by the dehumidification and cooling coil during a call for air conditioning shall be directed to the pool water. This raises the pool water temperature (0.5°F)(-17.5°C) above its normal temperature every 12 hours of air conditioning use. The refrigeration system is activated if either the space temperature drops below the setpoint, the relative humidity rises above its setpoint, or (for those systems with remote condensers) if the space temperature rises above the setpoint. The unit shall monitor space temperature and relative humidity, pool water temperature and building surface temperature. The thermal energy absorbed by the refrigeration system is distributed as follows:

- 1) First priority is given to maintaining the lap pool space temperature. No supplementary space heating system external to the unit is required.
- 2) Second priority is given to maintaining pool water temperature for the **pool water system**.
- 3) All remaining heat is then transferred to the (remote) condenser provided.

a. During the overnight hours when the outdoor temperature is lower, outside air is brought into the through the dehumidification unit to cool the pool water temperature back to its normal setpoint. Once the pool water temperature has reached its normal setpoint the dehumidification unit returns to normal operation.

b. A dehumidification unit mounted hot water heating coil 1 provides the supplemental heating required during the heating season. The dehumidification unit design shall be based on PoolPak, Inc., with

Dectron, Inc. being or equal. These manufacturer's have produced and installed thousands of these units worldwide and guarantee humidity and condensation control in the lap pool if designed, selected, and installed according to their criteria.

c. Air distribution in the lap pool consists of exposed ductwork routed around the exterior walls with linear or drum diffusers discharging air onto exterior walls and glass to control condensation. An ASHRAE recommended range of four to six air changes per hour shall be used to determine the total air flow requirements for the lap pool, ensuring that these rates also, meet calculated heating and cooling loads. The ASHRAE standard 62-1989 required ventilation rate of 0.5 cfm per square feet of lap pool space shall also, be used to determine dehumidification unit sizing.

1.11.3 Filtration

Indoor air quality is of primary concern, the combined supply air, including return and outside air, shall be filtered by 25 percent efficient filter as determined by the dust spot test specified in ASHRAE Standard 52.1 and particulate removal efficiency in ASHRAE Standard 52.2.

1.11.4 Ductwork

Supply air duct systems for variable air volume systems shall be sized using the static regain method and all duct shall be round or oval prefabricated. Supply air ducts from VAV air handling units to VAV boxes shall be built to at least medium pressure standards and class A seal requirements. All other duct shall be low pressure and built to low pressure and class c seal requirements. Offices with common exposures or functions shall be zoned together. Ergometry and fitness testing (ERGO) and wellness assessment rooms, computer room, HAWC Relaxation room (Massage room), classroom or conference room and food demonstration area shall be individually zoned. Ductwork in the gymnasium shall be exposed prefabricated spiral round. All other ductwork shall be sized using the equal friction method with 0.07 inches of water column per 100 feet (0.6 Pa per meter) for supply ducts and 0.1 inches of water column per 100 feet (0.8 Pa per meter) for return and exhaust ducts. Constant Volume duct velocity shall never exceed 1,400 fpm (8 m/s). Ductwork shall be metal except for fan connections. Ductwork serving Administrative areas shall typically be run above the ceiling in the corridors. There shall be 15 feet (4.6 meters) of return air duct to an air handling unit provided with acoustical liner (15 feet (4.6 meters)). This is the minimum amount of return air duct that will be accepted for each air handling unit. Flexible ductwork shall never exceed 6 feet (2 meters) in length. Duct Construction; all ductwork shall be constructed from galvanized sheetmetal, in accordance with SMACNA Guidelines. Locker room exhaust ductwork shall be aluminum.

a. **Pool Area BID OPTION** - Pool Area Ductwork

Fiberglass duct liner shall not be used. Duct materials and hardware must be resistant to chemical corrosion from the pool water moisture. 300 stainless steel, painted galvanized or aluminum duct shall be used in the pool area for exposed duct systems. No 400-series stainless steel may be used. Underground duct where used shall be PVC. Use anodized aluminum diffusers, registers and grilles.

1.11.5 Variable-Air Volume Boxes

VAV Boxes shall be concealed above ceiling of the controlled space and provide varying amounts of conditioned air in response to a space thermostat. Heating controls for VAV boxes shall be separate from perimeter heating (fin tube). All VAV boxes shall be equipped with a hydronic reheat coil with a three-way control valve minimum heating volume shall be set for 40% of full cooling volume.

1.11.6 Ceiling Mounted Supply Diffusers

Ceiling diffusers shall be suitable for use in a lay-in ceiling or a gyp board ceiling and shall be located as necessary. All new diffusers shall be provided with a 4-way adjustable discharge pattern; standard diffusers with fixed discharge patterns are not permitted. Diffusers shall be sized to distribute the required quantity of air evenly over the space intended without causing noticeable drafts, air movement faster than 50 fpm (15 meters per minute) in the occupied zone, or causing dead spots anywhere in the conditioned space. Maximum velocity of 514.6 fpm (3 meters/sec) with a NC of 30 maximum. Maximum diffuser size shall be 24 inch x 24 inch (600 mm X 600 mm), minimum size shall be 24 inch x 24 inch (600 mm X 300 mm). Drum diffusers shall be used in the gym.

1.11.7 Ceiling Mounted Return Grilles

Ceiling return air grilles, suitable for use in lay-in ceilings or gyp board ceilings, shall be located as necessary. The maximum size of new return grilles shall be 24 inch x 24 inch (600 mm X 600 mm), minimum size shall be 24 inch x 12 inch (600 mm X 300 mm). Return grilles shall not be located close to outdoor openings or in locations where bypassing of supply air may occur. Recommended return air velocities based on free area of the opening shall be 514.6 fpm (3 meters/sec).

1.11.8 Supply and Exhaust Fans

Except for wall mounted propeller units, all fans shall be centrifugal type and connected directly to weather-proof louvers using ductwork. Low leakage motorized dampers shall be provided. Fans larger than 2000 cfm (944 L/s) in capacity shall be provided with V-belt drives. Care shall be taken to ensure that the noise level generated by exhaust fans and associated relief louvers is not transmitted to the exterior of the building. In-line fans located outside the main mechanical and electrical areas shall be provided with a manufacturers standard acoustical enclosure to inhibit noise transmission to the adjoining occupied spaces. Sone value of fans measured 5 feet (1.5 meter) from fan inlet shall be less than 30 sones outside the mechanical equipment room. West mechanical room served by a boiler(s) shall be provided with supply fan(s).

1.11.9 Outdoor Intakes and Exhausts

New outdoor air intakes shall be located in areas where potential for air contamination is lowest such as away from overhead doors. Maximize the distance between intakes and exhausts by maintaining a minimum distance of 10 meters between intakes and exhausts and 50 feet (15 meters) between intakes and toilet, janitor room and etc.. Motorized low-leakage damper with blade and jamb seals, shall be provided at all outside air intake and exhausts. If feasible, locate intakes and exhausts on different building faces. Maximum velocity through net area of air intakes shall be limited to 514.6 fpm (3 meters/sec). Required flow rates shall be corrected for

altitude.

1.11.10 Special Requirements

1.11.10.1 Toilet/Locker Rooms

The rest rooms shall be exhausted at the rate of 2 cfm per square feet (10 L/s per square meters) except shower areas which shall be exhausted at the rate of 2.5 cfm per square feet (12.4 L/s per square meters) in order to maintain a negative room pressure or minimum VAV AHU outside air requirement whichever is greater. The required make-up air for the exhaust system shall be supplied by VAV boxes to supply air for the heating/cooling loads through VAV air handling units and through a door grilles (sized for a velocity of 514.6 fpm (3 m/s)).

1.11.10.2 Janitors Closet

The janitor closet shall be exhausted at the rate of 2 cfm per square feet (10 L/s per square meters) in order to maintain a negative room pressure. The required make-up air for the exhaust system shall be supplied through a door grille (sized for a velocity of 514.6 fpm (3 m/s)).

1.11.10.3 Mechanical and Electrical Equipment Rooms

a. The mechanical and electrical equipment rooms shall each be ventilated and cooled with outside air by thermostatically controlled fans; set to operate when the respective space temperature exceeds (85°F)(30°C). Size of fan shall be based on removal of heat generated in room so inside temperature shall not exceed (98.6°F)(37°C) at design ambient temperature, but the system design shall not be less than 10 air changes per hour. Some values of fans measured 5 feet (1.5 meters) from fan inlet shall be less than 20 Sones.

b. The mechanical equipment rooms containing gas burning equipment shall be provided with combustion air louver sized and located in accordance with NFPA 54. The combustion air louver shall be provided without dampers and shall be ducted down to within 12 inch (300 mm) of the mechanical room finished floor and ducted up to within 12 inch (300 mm) of roof level in order to minimize the potential for piping freeze-up in the mechanical room due to combustion air intake.

c. The boiler room shall be ventilated and cooled with outside air at a minimum rate of 20 AC/hr by a thermostatically controlled supply fan set to operate when temperature exceeds (85°F)(29.4°C).

1.11.10.4 Ergometry Testing Stations (ERGO)

ERGO stations shall be provided with separately zoned air conditioning. When the temperature exceeds (75°F)(23.9°C) an alarm shall sound and testing must stop **if required by User**. When the temperature of the room is greater than (70°F)(21.1°C) a ceiling fan shall automatically operate. Exhaust EGRO stations, Tape & Tape/Screen @ (120 cfm) (56.6 L/s) or 8 air changes per hour supply air during occupied times. See paragraph Design Conditions for additional required temperature ranges.

1.11.10.5 Laundry Room Exhaust

A 100 mm duct stub out shall be provided for each dryer in the Laundry room. The individual dryer exhaust ducts shall be collected and ducted to

the exterior of the building. The number of exhaust ducts that are run to the outside should be minimized. The dryer exhaust ductwork shall not terminate over a walkway or near a door. If necessary, exhaust fans shall be provided as part of the dryer exhaust systems ie. when travel distance exceeds 20 foot (6 meter), Alternatively, because of the requirement for only two dryers in the laundry facility and because the dryers are electrically heated, it will not be necessary to directly supply the laundry room with make-up air. A louvered or undercut door or transfer duct (sized for 500 fpm (2.9 m/s) will be required to allow for replacement air to the dryers.

1.11.10.6 Elevator Machine Room

For cooling purposes, the elevator machine room shall be ventilated at the rate of 100 cfm (47 L/s). The elevator machine room shall be ventilated 24 hours per day, 7 days per week. The required make-up air for the ventilation of the elevator machine room shall be supplied by providing an appropriately sized transfer grille in one wall of the equipment room that will allow air to be drawn in from the surrounding areas.

1.12 REFRIGERATION/CHILLED WATER SYSTEMS

These systems shall meet the requirements of Technical Specification 15620 LIQUID CHILLERS, 15181A CHILLED AND CONDENSER WATER PIPING AND ACCESSORIES and unless otherwise stated, shall comply with the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Handbooks and ASHRAE 15. Refrigeration equipment provided shall have an ozone depletion factor of 0.05 or less. HCFC-22 and HCFC-123 shall not be allowed. HCFC-22 and HCFC-123 alternatives shall be documented in the design analysis and catalog cuts provided for three manufacturer's before an alternate refrigerant equipment will be allowed. Chilled water pipe velocities shall be sized to not exceed 6 fps (2.4 m/s). Pipe sizing friction loss shall be based on 4 foot per 100 foot. maximum and a maximum pipe velocity of 4 fps (1.6 m/s) for piping 2 inch (50 mm) and less.

1.12.1 Chilled Water System Building Equipment Design

The chilled water system shall consist of the following:

a. The building chilled water system shall consist of a packaged, air cooled water chiller(s) located above grade and outside of the facility, two chilled water distribution pumps located in the mechanical equipment room, accessory equipment located in the mechanical equipment room and the chilled water distribution piping to the air handling units. The sizing of the chilled water system (including the chillers, chilled water distribution pumps, cooling piping, chemical feeder, air separator, expansion tank, etc.) shall depend on the calculated loads by the Contractor **for the basic plus bid options**. Size equipment with a piping losses allowance of 15 percent. The primary loop of the chilled water system shall contain a mixture of 50 percent water and 50 percent propylene glycol by volume. This primary loop of the chilled water system shall provide chilled water/glycol solution to the cooling coils of the make-up air units and air handling units. All exposed chilled water piping outside the building shall be provided with insulation.

1) Each unit shall be provided with condenser coil hail guards.

b. See paragraph POOL AREA DEHUMIDIFICATION UNIT & POOL WATER PLUMBING;

Unit shall be part of an enclosed swimming pool environmental control/energy recovery system. System shall include mechanical heat recovery, moisture removal and disposal, supply air fan, pool water heater, and complete solid state logic control system. Unit shall be provided with a remote pool water-cooled remote condenser. Pool water heating shall be controlled by a refrigerant solenoid valve which directs hot refrigerant gas into the pool water heater on a call from the control system. Water circuit shall be supplied with CPVC pipe stub-outs. Copper tubing and/or fittings in the pool water circuit shall be unacceptable. All refrigeration piping shall be copper Type L and shall be in accordance with ASTM 88 for copper tubing, and M-702.0 for joints and connections.

1.12.2 Chilled Water Systems

Air-conditioning shall be designed with chilled water as the cooling media.

The pumping, piping and hydronic ancillaries scheme shall be designed to include components described for the HYDRONIC HEATING SYSTEM that are applicable such as piping, air separators, expansion tanks, pumps, water treatment, air handling unit coils, etc.. The design shall include safeguards to protect against freezing damage. Each pump shall be provided with a calibrated bronze balancing valve. The entire building chilled water system including all piping, equipment and appurtenances, shall be filled with a solution of 50 percent propylene glycol and 50 percent water (by volume). This solution shall be added after all pressure testing and cleaning of piping systems has been satisfactorily completed and prior to testing and balancing of the systems. Required flowrates and head loss shall be corrected for glycol. This corrected flowrates shall be used in selecting all other cooling equipment i.e., cooling coils.

1.12.3 Other Systems

The use of evaporative cooling, heat pump, and dx coil type systems will not be permitted.

1.12.4 Chilled Water Circulating Pumps

The cooling water shall be circulated by two base mounted, end-suction, centrifugal pumps with mechanical seals. Each pump shall be sized for 100 percent of the maximum required cooling water flow and 100 percent of the maximum system head pressure. The pumps capacity shall be based on a (55°F)(12.8°C) supply and (45°F)(7.2°C) return water. The pumps shall be non-overloading allowing the pump to operate at any point on its characteristic curve. Each pump shall be provided with a suction diffuser and mounted on a 6 inch (150 mm) thick concrete housekeeping pad. Each pump shall be provided with a calibrated bronze balancing valve. Pumps shall run at temperature above (65°F)(18.3°C)(adjustable). If one pump should fail, the other stand-by pump shall start providing 100% of the full flow capacity. Pumps shall alternate starting and have run-time meters. Pump flow rate (and head loss) shall be corrected for glycol. This corrected flow rate shall be used in selecting all other equipment ie. coils.

a. Pump Control

A flow switch in the cooling water return line to each evaporator in the production loop shall allow the condensing unit to energize, only after flow has been established through the evaporator. The cooling water distribution pumps shall be controlled to run in a lead-lag configuration when the outdoor air temperatures is be above 60 degrees

F. (15.6 degrees C.), so that only the lead pump will operate.

b. Chilled Water System Accessories:

1. Expansion Tanks

A bladder type expansion tank may be provided in the cooling chilled water piping systems. The expansion tanks precharge pressure and acceptance volume shall be selected based on the layout of the piping systems. The STRUCTURAL DESIGN ENGINEER shall be thoroughly consulted before hanging the tank from the structure.

2. Air Separation Tanks

The chilled water piping systems shall be provided with an air separation tank. The air separators shall include an automatic air vent and make-up water system, consisting of a pressure reducing valve, strainer, reduced pressure type backflow preventer and isolation valves.

3. Water Treatment Systems

Provide a mixture of 50% propylene glycol and 50% water into the primary loop of the cooling systems. Provide a shot feeder (chemical feeder) at the cooling water distribution pumps to allow introduction of chemicals into the system. Provide the chemical treatment necessary to protect the cooling system's equipment from damage due to corrosion and freezing. Automatic glycol feeder when provided will allow Contractor to not provide air separator accessories.

4. Air handling Unit Coils

a. Each air handling unit coil shall be provided with a three-way control valve.

b. Coils shall be selected with no more than 514.6 fpm (3 m/s) coil face velocity.

c. Leaving air temperatures for cooling coils shall be between (55-57°F)(12.8-13.9°C)

5. Piping

All piping shall be pitched up in the direction of flow, (1 inch in 40 feet) (25.4 mm per 12 meters) shall be designed without pockets which would permit accumulation of air, and shall be provided with vents at high points and drains at low points.

6. Pipe Materials

All new cooling water piping within the facility shall be black steel conforming to ASTM A53, Schedule 40 or copper.

7. Pipe Joints

Cooling water pipe joints shall be of the following types:

a. Chilled piping installed within the facility shall utilize threaded joints or welded joints. Welded joints and fittings shall be used for joints 2-1/2" (65 mm) and larger. Copper pipe joints 2 1/2 inch (65

mm) and larger shall be brazed.

b. Connections to equipment shall utilize unions for pipe 2" (50 mm) and smaller and flanges for pipe 2-1/2" (65 mm) and larger.

8. Pipe Expansion

In runs of pipe 50 feet (15 meters) and longer, or in shorter runs where required, indicate size on project drawings the location of all anchors, bends, loops, and pipe guides to adequately limit and provide for pipe expansion. Do not use expansion joints in piping unless absolutely necessary and justified. Anchors and guides shall be indicated on the project drawings and detailed for installation in the building structure provided. The STRUCTURAL DESIGN ENGINEER shall be thoroughly informed of all forces generated.

1.13 BUILDING TEMPERATURE CONTROL SYSTEMS

This paragraph contains instructions and engineering requirements for the design of the new building temperature control systems required for the operation of the building mechanical systems. The temperature controls shall be Native BACnet (Alerton Technologies Inc., Automated Logic Corporation or Delta Controls Inc.)(fully integrated and connected to the Base EMCS system in a separate future contract) supplied by the Contractor supplier in this contract and coordinated with the DDC supplier. All HVAC functions in the DDC system shall be controlled and monitored by the DDC. The design of the control systems for the HVAC equipment shall be in accordance with Technical Specification 15951A DIRECT DIGITAL CONTROL FOR HVAC. DDC supplier shall provide equipment and services, including software database programming, DDC panel programming, graphics generation, and calibration. End-to-end testing DDC panels. The control system shall be designed to provide continuous and automatic control of all HVAC equipment. Where equipment is provided with a packaged control system, such as in the case of boilers or chillers, the building control systems will interface with the equipment's packaged control systems. The temperature control panels shall be located in the mechanical room(s). The number of control panels shall be dictated by the number of and types of equipment in the final design. This type of control system allows the future EMCS operator to easily adjust setpoint, operating times and other system parameters, if and when necessary, after the building has been occupied and shall be prepped for EMCS by UFGS section 13814A BUILDING PREPARATION FOR EMCS.

1.13.1 DDC/EMCS Requirements

All mechanical systems and equipment, shall be controlled by local direct digital control (DDC) panel(s) located in each facility Mechanical room(s). One (Alerton Technologies Inc., Automated Logic Corporation or Delta Controls Inc.) DDC panel shall be provided in the Fitness Center. The DDC panel(s) shall operate in a stand alone fashion. A (Alerton Technologies Inc., Automated Logic Corporation or Delta Controls Inc.) design shall be provided, using Technical Specification Section 15951A DIRECT DIGITAL CONTROL FOR HVAC. To facilitate maintenance and to allow manual starting and stopping of equipment by maintenance personnel, a hard-wired Hand-Off-Automatic (HOA) control switch shall be provided for each new major piece of equipment (air handling unit, pump, exhaust fan, etc.) in order to override the automatic DDC start and stop functions.

- a. Fire alarm condition on any fire alarm circuit shall automatically initiate the deactivation of the air handling units throughout the building.
- b. All computing devices, shall be as defined in FCC Rules and Regulations FCC Part 15, and shall be certified to comply with the requirements for Class A computing devices and labeled as set forth in FCC Rules and Regulations FCC Part 15.
- c. Temperature Control Contractor Experience - The temperature control Contractor shall have a working knowledge of DDC system and experience installing these systems. The Contractor shall provide for approval the names and qualification of supervisory personnel (ie. Project Manager and /or Superintendent) that will be used on this project. The Contractor shall also provide a list of references to be contacted from recent projects on which the proposed personnel performed similar duties. Approval shall be based on previous experience with DDC systems, qualifications and demonstrated ability of proposed personnel to manage resources in an efficient and effective manner. Experience and supervisory personnel qualifications must be submitted and approved before submittal of any technical data.
- d. Emergency Service During Warranty - The Government will initiate service calls when the installed DDC/EMCS is not functioning properly. Qualified personnel shall be available to provide service to the complete DDC/EMCS installed under this project. Qualified personnel shall be defined as a factory trained journeyman in the brand of control system provided, this level of training shall be considered a minimum. The Government shall be furnished with a telephone number where the service supervisor can be reached at all times. Service personnel shall be at the site within 8 hours after receiving a request for service. The control system shall be restored to proper operating condition within 24 HOURS after receiving a request for service. This requirement shall be for one year in addition to the warranty period at no cost to the government.
- e. Software - The Contractor shall provide all software updates and verify operation in the system. These updates shall be accomplished in a timely manner, fully coordinated with base operators, and shall be incorporated into the operations and maintenance manuals, and software documentation provided as submittals in section 15951A. There shall be at least one scheduled update near the end of the first year's warranty period, at which time the Contractor shall install and validate the latest released version of the Contractor's software.
- f. All utility meters shall be provided to be connected to the base EMCS system to allow the necessary monitoring in the future.
- g. Fuses shall not be used for surge protection. Provide transient voltage surge suppression (TVSS).
- h. Not Used.
- i. Scheduled inspections shall be at the beginning of construction.
- j. Temperature sensors for the DDC controllers shall be selected to be 1000 ohm curve 2 thermistor or 4-20 Ma which will permit their use with the future EMCS/DDC system.

1.13.2 Future EMCS Interface

The control system serving the facility shall be a system expansion of, and sources to match, the future Base EMCS. All services, materials, equipment, hardware, and software necessary to install the EMCS expansion and for interfacing to the future system shall be provided. At the completion of the system expansion, all the new control panels and input and output control points/devices shall be fully integrated into the future system. The Building shall be prepped for EMCS using UFGS specification 13814A BUILDING PREPARATION FOR EMCS.

a. Operator Access

Access to the system expansion by the Base EMCS operators shall be seamless via the future work stations on the EMCS LAN and the expansion connections to it. That is, it shall require no different hardware or software or operation steps to access than any of the control panels on the future system. System expansion access shall allow the EMCS operator to perform the following real-time functions on the new equipment using the same work stations and software required for accessing the future EMCS:

1. Display the status of all inputs.
2. Manually display of changes to the status of all outputs.
3. Display and adjust all control loop and all other permanent (battery-backed RAM and/or EEPROM-based) database parameters.

b. Graphic Screens

Provide and integrate graphic display screen files into the future system, each consisting of a schematic diagram of a mechanical system with real-time statuses of new inputs and outputs superimposed upon the schematic diagram. In conjunction with future software base packages, the screens shall allow an operator to not only view, but also command changes to the statuses of all outputs.

c. Alarm Monitoring

Alarm monitoring shall be provided for all major pieces of equipment. Indication of failure shall alarm at the future EMCS Operators Work station. The maximum allowable time for the EMCS to display an alarm condition is 10 seconds starting from the time the alarm condition first exists. The maximum allowable time for equipment to respond to manual EMCS commands is 10 seconds starting from the time the command is initiated at the work station. The system expansion shall not impede the capabilities of the DDC system to meet these requirements. Alarm monitoring shall include (Alerton Technologies Inc., Automated Logic Corporation or Delta Controls Inc.), but not limited to the following alarm indications:

- Loss of flow
- High and low temperature
- High and low humidity
- Loss of power
- High and low pressure
- Freeze detection
- Summary alarm
- Start/stop actual status different from commanded state

1. Each start/stop is to be paired with a true status input. EMCS alarms shall be generated whenever the status input state varies (longer than some adjustable time delay) from the corresponding output's matching state.

1.13.2.1 BACnet Based system

BACnet based system shall be in accordance with the following unless otherwise indicated:

a. Work Required

Furnish a Building Automation and Controls Network (BACnet) based system. This includes all global controllers, logic controllers, and all input/output devices. Items of work included are as follows:

1. Provide all necessary BACnet-compatible hardware and software to meet the system's functional specifications. Provide Protocol Implementation Conformance Statements (P.I.C.S.) for system controllers, including unitary controllers. All direct digital logic hardware to be in compliance with American Society of Heating Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) Standard 135-1995.
2. Design, provide and install all equipment cabinets, panels, data communication network cables needed, and all associated hardware.
3. Provide and install all interconnecting cables between cabinets, logic controllers, and input/output devices.
4. Provide complete manufacturer's specifications for all items that are supplied. Include vendor name of every item supplied.
5. Provide as-built documentation, terminal software, and all other associated project operational documentation (such as technical manuals) on approved media, the sum total of which accurately represents the final system.

b. General Overview

1. Provide a distributed logic control system complete with Direct Digital Control (DDC) and Direct Analog Control (DAC) software. System shall be totally based on BACnet ASHRAE Standard 135-1995. This system is to control all mechanical equipment, including air handlers, heating equipment, fans, pumps, and other specified equipment, directly without intervening electric, analog electronic, or other non-BACnet compliant controls.
2. The communication network between controllers must be conform to BACnet and communicate at a minimum of 156 kbps. The ASHRAE BacNet over ArcNet standards have been adopted by and shall be utilized at Buckley AFB.
3. The entire processing system shall be completely in compliance with BACnet specification: ASHRAE 135-1995. The system shall use the BACnet over ArcNet protocol throughout and exclusively. This means that the system must use BACnet as the native communication protocol between distributed controllers communicating on the controller network (i.e. Field Bus) and must, as a minimum, be Conformance Class 3.

Non-BACnet-compatible or proprietary equipment or systems (including gateways) shall not be acceptable and are specifically prohibited.

4. All logic controllers for terminal units, air handlers, central mechanical equipment shall communicate and share data, utilizing only BACnet protocols, at 38.4 kbps or faster for the terminal controls and 156 kbps or faster for the primary equipment controllers serving AHU's, chillers, boilers etc.

5. The building BacNet 156 kbps communication trunk shall be provided by the temperature control contractor and shall be connected via a control contractor provided EtherNet to BACnet router/bridge to the base wide EtherNet/Copper Network.

c. Basic System Features:

1. Zone by zone direct digital logic control of space temperature, scheduling, optimum starting, equipment alarm reporting, and override timers for after-hours usage. A zone is the area served by one Heating, Ventilation, Air-Conditioning (HVAC) logic controller unit (for each Variable Air Volume (VAV) box, fan coil, etc.)

2. The complete system, including, but not limited to terminal unit controllers, global controllers and operator's terminals shall auto-restart, without operator intervention, on resumption of power after a power failure. Database stored in global controller memory shall be battery backed up for a minimum of 1 year. All other logic controllers shall utilize Electronically Erasable Programmable Read Only Memory (EEPROM) for all variable data storage.

3. Modular system design of proven reliability.

4. All controllers communicate utilizing ASHRAE protocols contained in the BACnet 135-1995 standard.

5. All controller enclosures shall be NEMA 4.

1.13.2.2 Controllers

All modulating mechanical processes (e.g., temperature, pressure, flow control) shall be controlled directly by the local DDC control panel. Except for safety and protection functions, software logic shall be used in lieu of relay logic. The contacts of safety and protection function instruments shall be hardwired in series with the common side of each equipment's HOA switch, and their proper operation shall not depend in any way upon the DDC.

1.13.2.3 Digital Controllers

Digital controller blocks or points within the control panels shall utilize a full proportional algorithm.

1.13.2.4 Stand-Alone Operation

The local control panels shall be fully capable of stand-alone operation on a continuous basis. All programs, including those based upon real-time clock or calendar events, shall reside in the local DDC panel.

1.13.3 Input/Output Devices

The control system shall utilize off-the-shelf input and output instruments (e.g., RTD sensors, actuators, relays) which are commercially available from third party vendors and who are independent from the DDC panel manufacturers.

1.13.4 Analog Sensors, Digital inputs & Digital outputs

All sensing devices shall be capable of removal from the system without disruption of service to the system in which they are installed. Sensors provided shall include, but not limited to, the following:

Stations (to be shown on mechanical HVAC drawings)	Supply air, return air, & outside air; Air Flow Measuring
	Boiler inlet temperature
	Boiler outlet temperature
	Boiler fuel flow
	Boiler water reset
	Heating water flow
	Chilled water flow
	Chilled water inlet temperature
	Chilled water outlet temperature
	Space temperature(s) (to be shown on mechanical HVAC drawings)
	Outside air temperature sensors (to be shown on HVAC
mechanical drawings)	
	Mixed air temperature sensors (to be shown on HVAC mechanical
drawings)	
	Discharge air temperature sensors
	Preheating Coil Controls
	Heating Coil Controls
	Chilled water Cooling Coil Controls
	Hot water pump(s) status
	Hot water pump(s) start/stop
	Chilled water pump(s) status
	Chilled water pump(s) start/stop
	Air handling unit(s) status
	Air handling unit(s) start/stop
	Return air fan(s) status
	Return air fan(s) start/stop
	Kilowatt meter
	Gas meter
	Water meter
contactors	Exterior Lighting Control on/off through the lighting
drawings)	Space relative humidity (to be shown on mechanical HVAC
	Fan Coil Heating Coil controls
	Fan Coil Cooling Coil Controls
	Fan Coil units start/stop
	Fan Coil status

Liquid flow measurement for use by the DDC system shall be performed by paddle wheel-type flow sensors only. Pitot-type sensing elements may be installed for local instrumentation used for testing and balancing purposes only.

1.13.5 Not Used

1.13.6 Control Valves

Sizing of control valves shall take into account upstream and downstream fittings and shall be in accordance with Instrument Society of America standard ISA S75.01-1985.

1.13.7 Variable Air Volume Boxes

VAV boxes shall be fitted with DDC controllers and velocity sensors compatible with the DDC provided. VAV box temperature sensors shall be located atop an associated return grille and be provided with 9.2 meters of sensor wire for future relocations. Where VAV air handling units with VAV boxes are provided, flow monitoring stations shall be provided to ensure proper indoor air quality when operating at minimum supply air flows.

1.13.8 Damper Actuators

All main mechanical equipment; AHU's, boilers, chillers, etc., shall be provided with 0-10 Vdc operated damper actuators. All minor/remote equipment; VAV boxes, unit heaters etc. shall be provided with 0-10 Vdc operated dampers operators.

1.13.9 Valve Actuators

All main mechanical equipment; AHU's, boilers, chillers, etc., shall be provided with 0-10 Vdc operated damper actuators. All minor/remote equipment; VAV boxes, unit heaters etc. shall be provided with 0-10 Vdc operated valves operators.

1.13.10 HVAC Control Drawings

HVAC control drawings, for both the 60 percent and Final submittals, shall be in accordance with SECTION 01336 - 60 PERCENT DESIGN REQUIREMENTS, & SECTION 01338 - 100 PERCENT DESIGN REQUIREMENTS. Control drawings for each facility shall include a system schematic section, an elementary (ladder) diagram, a detailed sequence of control, a list of required components with a brief description of each component, a control panel detail, legend and schedules, a listing of input and output points and a matrix showing the point type, alarms and applications programs associated with each of the input or output points. EMCS details and points to be monitored shall be detailed on the contract drawings and follow the conventions as set forth in TM 5-815-2. System I/O summaries shall be detailed.

1.13.11 Control Schematic

The control schematic shall be a schematic representation of the HVAC system and the associated control equipment. The control schematic shall be drawn to a large scale to allow for ample space to indicate any necessary performance parameters such as setpoint, etc.. The control schematic shall be cross referenced to the elementary diagram and the control panel detail by numbered terminal points. Each component shall be identified by a unique alpha-numeric designator such as S1 for sensor number 1. This provides a means of cross referencing to the description of components and the sequence of control. All major control items relative to the system shall be shown. This may include, but shall not be limited to:

Supply Fans

Filters

Cooling Coils

Heating Coils

Pressure Sensors/Switches

Flow Sensors/Switches

Freezestats with manual reset

Smoke Detectors with connection to the FACP

Temperature Sensors

Valves and Valve Actuators

Dampers and Damper Actuators

VAV Boxes

Humidifiers

Relative Humidity Sensors

Fan Coils

1.13.12 Elementary Diagram

An elementary diagram or diagrams shall be provided showing the wiring of the control system devices. It shall be drawn to a large scale for easy reading and to allow space for indicating performance parameters. The elementary diagram shall be cross referenced to the control schematic and the control panel detail through the use of numbered terminal points.

1.13.13 Sequence of Control

The sequence of control is a written statement of the operation of the system. It should be as detailed and complete as possible and it should refer to individual components by their alpha-numeric designator whenever possible. The sequence shall break the overall system into sub-systems, such as supply fan control, humidification, dehumidification, mixed air control, pre-heating coil, heating coil control, cooling coil control, etc., and shall describe the operation of each of the subsystems. The sequence of control shall also describe the operation of all safety devices such as smoke detectors or freezestats, fire alarm interlock and shall describe the operation of the system in both the occupied, warm-up and unoccupied modes.

1.13.14 Description of Components

The description of components shall provide a generic description of the performance of each component. The components shall be referred to by their alpha-numeric designator.

1.13.15 Control Panel Detail

The control panel detail shall show the intended mounting location of any

devices that are to be located in the control panel or on the front face of the panel. All field sensors and controls will be connected to data terminal cabinets to provide ease of diagnosis and repair of the system components. DTC panels shall be as specified in section 15951A with installed spares plus 25 percent expansion of each type of I/O function being provided. Control panels and DTC panels shall be shown on mechanical drawings.

1.13.16 Legends and Schedules

The legend shall provide a definition of all symbols used in the control drawings. Schedules shall provide all necessary information to clarify the operation of the components or the overall system.

1.13.17 System Checklists and Startup Instructions

The designer shall develop Pre-commissioning Test Checklists, Functional Performance Test Checklists, and Startup Instructions for each system and item of equipment controlled by the temperature control system and shall include them in the temperature controls Specification. Each system and item of equipment shall have its own separate Checklist and Startup Instructions. The Checklists and Startup Instructions shall be tailored to each individual component of the respective system or item of equipment and shall use the terminology and nomenclature used in the drawings and specification.

1.14 TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS

This Section contains instructions and engineering requirements relating to the testing, adjusting, and balancing requirements of new mechanical HVAC systems. The work required by this section shall be complete, including all test and inspection reports, before starting the EMCS Field Test. Testing, adjusting, and balancing shall meet the requirements of Technical Specification 15990A TESTING, ADJUSTING AND BALANCING OF HVAC SYSTEMS.

1.14.1 Balancing Firms Qualifications

Testing, adjusting, and balancing (TAB) shall be performed by an independent firm using certified technicians under the direct supervision of a certified technician. Technicians shall be certified by the National Environmental Balancing Bureau (NEBB) or the Associated Air Balance Council (AABC). The firm shall select AABC MN-1, or NEBB-01 as the standard for providing testing, adjusting and balancing of the mechanical systems. Air handling units' filters shall be artificially loaded during testing and balancing operations. Air handling unit(s) air flow shall be set for maximum with filters fully loaded.

a. TAB can be performed only after each system is complete, including installation and operation of controls, and all aspects of the facility that have any bearing on the HVAC systems, including installation of ceilings, walls, windows, doors, and partitions, are complete. All items such as ductwork and piping parts, terminal connections, etc, necessary to perform TAB shall be complete during the Systems Readiness Check.

1.15 TECHNICAL SPECIFICATIONS

Government provided (UFGS) technical guide specifications (available to the Design-Build Contractor as indicated in Section 01332, SUBMITTALS FOR DESIGN) shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product and installation requirements for the facility. The specifications shall be edited in accordance with the designer notes associated with each specification and with the Specification Requirements (Division 01 General Requirement Specifications). In case of a conflict, the criteria found in the Specification Requirements (Division 01 General Requirement Specifications) shall take precedence. The provided specifications define the minimum requirements for items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals and testing that shall be provided for the facility. Where items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals or testing requirements are not covered in the provided specifications, special Sections within each guide specification(s) shall be prepared to cover those subjects. Specific items of equipment identified in the provided specifications but not required for the facility shall be edited out.

1.16 ENERGY USE BUDGET (EUB) COMPLIANCE CHECK

Design energy Usage (DEU) estimates shall be calculated for the new building to verify compliance with EUB in accordance with 10 CFR, Subpart A, Part 435, ASHRAE/IESNA 90.1; and the Energy Policy Act of 1992. Energy Usage Budget shall be done without process loads. Values indicated below shall be the maximum EUB target allowed. DEU shall be less than Energy Usage (EUB) target values indicated in Table I.

Table I
Energy Usage Budget Target For This Project.

Building	Type	Region	EUB Target	Days/Week
Physical Fitness	K	6	**50,000 Btuh/square feet/year (570 Mjoules/square meters/year)	16/7

** Those buildings EUB designated with ** shall be provided using a computer-based program.

M = Million

1.16.1 Computer Simulation

The Energy Usage Budgets shall be calculated using a computer simulation. Method used must take into account the constantly changing temperatures, sun loads, etc., through a year's operation. Use of the program "BLAST" is encouraged. If "BLAST" is used, the "REVIEW SUMMARY REPORT" shall be included in the output report. Any program other than Building Load Analysis and Systems Thermodynamics "BLAST", "TRANE TRACE 600", Carriers' latest version, DOE 2.1.E or BESA (Canada) requires prior approval for use. Request for use must demonstrate compliance with the following:

1.16.1.1 Acceptable Engineering Procedures

The energy analysis and building simulation will use a computer program which is based on acceptable engineering procedures. Load calculations and the systems simulation will be on an hourly basis for 12 to 365 days. Although hourly data for 365 days is preferred, a minimum of 12 model days (a statistically average day per month) is acceptable. If calculations are based on less than 365 days, the weather data selected for these days will be statistically derived.

1.16.1.2 Capable of Change

The computer program must be capable of changing the various cooling and heating loads and the thermostat settings to simulate building operations and to simulate dead band and deck/coil reset control strategies.

1.16.1.3 Cooling and Heating Loads Influencing the Building Design

The program must consider all cooling and heating loads which influence the building design. These include solar, outside air, people, lighting, equipment, etc., as well as taking into account the thermal time lag of materials.

1.16.1.4 Alternatives

Some of the alternatives that the program should be capable of analyzing include:

- a. Orientation of Building.
- b. Wall and roof construction and insulation.
- c. Dimensions of Building.
- d. Window area, solar shielding, tinted, and single or multiple glazed windows.
- e. Types of fuel.
- f. Central heating versus individual systems.
- g. Type of equipment.
- h. Type of mechanical systems, e.g., Constant/Variable volume, single zone/multizone.
- i. Type of lighting systems, e.g., standard incandescent or fluorescent and low wattage, high output lighting systems.

1.16.2 Not Used

1.16.3 Summary Report

Provide a summary section in the separate energy analysis report and results in the design analysis. Include all input data such as U values, design temperatures, hours of operation, building population and size, etc. Include output data such as distribution percentages (lighting, heating, cooling, fan, etc.).

1.17 TRAINING

Training courses shall be conducted for 15 operating staff members designated by the Contracting Officer in the maintenance and operation of all systems (one week for DDC/EMCS controls). Two week notice shall be given the Contracting Officer prior to training. A training day is defined as 8 hours of classroom instruction, including breaks and lunchtime, Monday through Friday, during the daytime shift in effect at the training facility. For guidance in planning the required instruction, the Contractor shall assume that the attendees will have a high school education or equivalent, and are familiar with the systems. No training shall be scheduled until training manuals and O&M manuals have been approved by the Government. A minimum of 15 O&M manuals shall be provided for the instructions and 1 manual for each facility shall be given to the Contracting Officer to turnover to the Base Civil Engineer.

1.17.1 Training Course Content

The courses shall be taught at the project site for a period of 5 training days. The training courses shall cover all the material contained in the Operating and Maintenance Instructions, and O&M manuals the layout and location of each system and shall include the following for each system:

- a. Troubleshooting
- b. Diagnostics
- c. Calibration
- d. Adjustment
- e. Commissioning
- f. Repair procedures

(1) Typical systems and similar systems may be treated as a group, with instruction on the physical layout of one such system. The results of the performance verification tests and the calibration, adjustment and commissioning reports shall be presented as benchmarks of the system(s) performance by which to measure operation and maintenance effectiveness.

1.18 NOT USED

1.19 FOOD SERVICE EQUIPMENT

This section contains instructions and engineering requirements relating to the design of the Food Service Equipment. Food Service Equipment shall comply with local health standards, NSF, AGAL, NAMA, NFPA 96 and UL and shall meet the requirements of Technical Specification 11400. Design Agent shall coordinate with Section 01007 ELECTRICAL REQUIREMENTS. These are the actual equipments requirements and shall form the basis for editing of specification section 11400A for the contract documents. Provide rough-in plumbing for HAWC Area BID OPTION equipment including reach-in refrigerator, automatic ice makers, sinks, ice machine and dishwashers.

a. Reach-in Refrigerator/Freezer

Provide 22 cubic feet reach-in refrigerators/freezers with reach-in sections located in Kitchen/Food Demonstration area - **HAWC area BID OPTION** and Workroom N.I.C.

Two-section reach-in refrigerator/freezer, with self-contained, lockable, bottom mounted (R-134a) refrigerator system designed to

maintain (35°F)(1.7°C) in a (90°F)(32.2°C) surroundings. Two-section reach-in freezer, with self-contained, top mounted (R-404a) refrigerator system shall be designed to maintain (0°F)(-17.8 °C) in a (95°F)(35°C) surroundings. Exterior finish shall be stainless steel for cabinet front and door panels. Cabinet interior shall be of aluminum. Cabinet sides shall be aluminum. Cabinet insulation shall be 2 1/2 inch (63.5 mm) foam-in-place polyurethane foam. Solid door insulation shall be 1 3/4 inch (44 mm) foamed-in-place. shall be furnished with full length height solid doors; Furnish with six steel shelves in each section. Provide 6 inch (150 mm) stainless steel legs. Refrigeration system shall be expansion valve type with exterior digital thermometer and power "on" light. Power shall be 115/60/1 phase.

The following standard features shall be provided:

Energy Saving Defogger Control
Exterior LCD Digital Thermometer
Self-Closing Doors with Stay/Open Feature at (120°F)(48.9°C)
Cam Lift Guide Hinges - Guaranteed for Life
Automatically Activated Interior Lighting
Magnetic Door Gaskets
Horizontal Work Flow Door Handle - Guaranteed for Life
Automatic Condensate Evaporator
Locks
Cord Set Attached
Stainless Steel Breaker Caps

With the following Accessories:

Additional four-year Compressor Warranty

b. Ice Making Machine

Provide ice making machine in expanded juice bar. Ice making machine shall be a cube type, air-cooled, ice maker with an Air Conditioning and Refrigeration Institute certified production capacity of 243 lbs. (109 kg) of ice per 24 hours (and 100 lbs. (45 kg) of built-in storage) at 32 degrees C. (90 degrees F.) air and 21.1 degrees C. (70 degrees F.) water temperature in accordance with ARI Standard 810-91. Refrigerant shall be R-134a. Ice making machine shall have stainless steel exterior panels. Ice making machine shall measure overall 24 inch x 39 inch x 24 inch (610 mm wide x 991 mm high x 610 mm height). Ice making machine shall produce rhomboid shaped cubes measuring 1/4" x 1/4" x 1/4" (22 mm x 22 mm x 22 mm). Ice making machine shall have an ice thickness control to assure uniform ice thickness without using pressure controls and thermostats or requiring adjustments for fluctuation in air or water temperatures with electro-mechanical control on front of unit. The vertical evaporator shall be vertical and ice shall be harvested by gravity without mechanical assistance. Each ice making machine shall have an air cooled condenser and shall be wired 208-60-3 phase. Front louvers no side or back clearance required.

Ice making machine shall be mounted on ARI certified ice bin which shall be rated in accordance with ARI Standard 820-88 as having a storage capacity of 243 lbs. (109 kg). Ice bin shall be by the same manufacturer as the ice maker. Ice bin liner shall be seamless polyethylene. Overall size of the ice bin shall match ice maker machine requirements of the manufacturer. Ice bin shall be furnished

with stainless steel exterior finish to match ice maker and shall be mounted on 6.5" (165 mm) high stainless steel legs with adjustable feet. Ice maker shall be mounted to the top of the ice bin in accordance with the manufacturer's recommendations. The bin shall be equipped with stainless steel adapters to mount 24 inch (610 mm) ice machine. Ice making machine shall be equipped with the manufacturer's standard equipment.

c. Kitchen Sink (Vegetable sink) and Hand Washing Sink - **HAWC Area BID OPTION**

Kitchen sink and hand washing sink shall conform to requirements of NSF No. 2. Sinks shall be constructed of minimum 14-gauge stainless steel.

Sink shall be double basin and provided for sprayer attachment. Faucet shall be 8-inch (203 mm) swivel spout with index handled lever handles.

d. Full-Size Electric Range/Oven - **HAWC Area BID OPTION**

Provide full-size electric range in Kitchen/Food Demonstration area. Oven to be 36 inch (914 mm) electric Range sealed-top with 12 inch (305 mm) thermostatically controlled griddle (right side). Exterior finish shall be stainless steel, with 10 inch (254 mm) high backguard with slotted black enameled angled cap. Oven door liner, side and rear linings shall be porcelain enameled, with contoured front stainless steel plate rail. Oven shall have a minimum of four-position rack supports and shall be furnished with two racks. Oven compartment and door shall be fully insulated. Oven shall be provided with 6-inch (152 mm) adjustable legs. Shall be provided with six all purpose tubular heating elements, energy regulator switch controlled. With additional set of four casters. Total KW load = 19. Overall dimensions 36 inch (915 mm) wide x 37 3/4 inch (959 mm) height x 34.36 inch (873 mm) deep. Power requirements 208/60/1 phase or 3 phase. When oven is separate the oven shall be double-compartmented.

e. Under counter Dishwasher

Provide under counter dishwasher in Kitchen/Food Demonstration area - **HAWC Area BID OPTION**, and juice bar N.I.C. Dishwasher to be single tank, manually fed, spray type, stationary rack, automatically controlled, electrically heated, commercial machine. The dishwasher shall be capable of handling 20 inch x 20 inch (508 mm x 508 mm) nominal size racks at a minimum rate of 30 racks per hour when operating with 140 degrees F. (60 deg C.) wash water temperature and (180 °F)(82.2°C) final rinse water temperature. The dishwasher shall be designed for under counter use, and be provided with labyrinth type door design. Tank wash chamber, frame, door, upper and lower spray wash and rinse assemblies, scrap collection and straining devices. Wash tank shall be filled automatically from (180 °F)(82.2°C) rinse water supply. The tank shall be equipped with a built-in electric booster heater to maintain the required wash temperature as well as heating incoming water to 180 degrees F.(82.2 deg C.). Tank shall have drain and overflow provisions as standard with the manufacturer. The wash, dwell and rinse cycles shall be automatic timed operation. Two minute totally automatic cycle shall include, automatic fill, automatic start, automatic pumped drain for both floor and wall drain installations. Unit shall use a maximum of 1.1 gallons (4.2 liters) of water per cycle. Provide with fresh water rinse. Dishwasher shall be provided with pressure indicating devices and indicating lights for cycle of

operation all as standard with manufacturer. Furnish with one peg and one flat rack. One dish rack and one combination cup, bowl, and silverware rack shall be included, visible pressure gauge standard, manual override for extended wash and delivering purposes. Overall dimensions 33 1/4 inch height x 24 1/4 inch width x 22 5/8 inch deep (844 mm x 615 mm x 574 mm) with door opening depth 39 1/2 inch (1003 mm). Power requirements include 3/4" horsepower pump motor, 6.7 Kw electric booster; 115/60/1 phase.

1. Dishwasher waste piping

With this type of equipment, certain localities require the use of cast-iron waste piping for the first 15 feet (4.5 meter) from the waste receptacle.

f. Kitchen Canopy Exhaust Hood (NFPA 96 TYPE I)

Kitchen cooking vapors are exhausted through an exhaust hood equipped with grease extracting baffles, automatic grease wash down, or an approved fire extinguishing system or a water spray fire protection system (See Section 01008 FIRE PROTECTION and specification section 11400). Hood shall not be part of a gas fired rooftop Kitchen make-up air system. Items served by the Kitchen canopy are the range. Hoods shall be constructed of 18-gauge stainless-steel. Make-up air supplied to the hood must shutdown in accordance with NFPA 96 and section 01007 ELECTRICAL REQUIREMENTS including the following:

- 1) Shut-trip electrical power to cook-top range.
- 2) Shut off all make-up air to hood.
- 3) Notify Fire Alarm System of alarm condition.

Dry Chemical fire suppression systems are no longer approved or listed, for protecting Kitchen hood systems and cooking equipment. Where required use pre-engineered wet chemical fire extinguishing systems and include in section 11400 KITCHEN EQUIPMENT REQUIREMENTS. A fire-actuated (286°F)(141.1°C) damper shall be installed in supply air plenum at each point where a supply air duct inlet or a supply air outlet penetrates the continuously welded shell of the assembly. The damper shall be listed for such use or be part of a listed exhaust hood with or without exhaust dampers.

1. Alternative: The fire extinguishing system can be eliminated from the grease removal, hood and duct system, if the cooking equipment is served by a fire-actuated water system listed to extinguish fire in the grease removal, hood and duct system. These systems are usually provided as part of the grease extractor wash down system.

2. Alternative: Wet chemical fire extinguishing system can be specified to protect all components of the kitchen exhaust system including the duct system. If the wet chemical fire extinguishing system is listed for unlimited duct length protection, protection of duct system is usually accomplished by providing a nozzle in the duct throat only, downstream of the grease extractor. Activation of this nozzle or the water system acts to extinguish the fire in the duct. When fire extinguishing systems are activated, exhaust should remain on. Make-up air supplied to the hood must be shut-off per NFPA 96 and section 01007 ELECTRICAL REQUIREMENTS.

3. Kitchen Ductwork

Shall be in accordance with section 11400A and latest NFPA 96. Per NFPA 96 exhaust duct shall lead as directly as is practical to the exterior of the building, so as to not unduly increase any fire hazard.

Ducts shall also have a clearance of at least 18 inches (457 mm) to combustible material. Exhaust ducts must be provided with access openings at all changes of direction and at 12 foot (304 mm) intervals, for cleaning and inspection purposes.

g. Backflow Preventors

Each item of food equipment having water supply and water connection with the water inlet connected below the flood level of the equipment, shall be supplied with a backflow preventor of size and proportions that will allow an ample flow of water to the equipment, but will prevent backflow of waste or polluted water into the water supply system.

h. Plumbing

Plumbing shall be provided as required by Technical Guide Specification 15400 PLUMBING, GENERAL PURPOSE, and herein required. High temperature or chemical rinse may require special (acid-resisting) piping.

i. NFPA 96 Type II Kitchen Range Hood

Each kitchen shall have an electric exhaust hood that is located directly above the electric range. The hood exhaust shall be ducted and discharge directly to the outside, separate of any other hoods or devices. The louvers shall be an inconspicuous part of the overall building appearance. The hood shall be provided with a High-Low-Off manual fan speed selector switch and a separate On-Off light switch. The hood shall include mesh grease filter(s) which are easily removable for cleaning. The hoods fan shall have a minimum capacity of approximately 130 cubic feet per minute (60 L/s) at high speed. No kitchen hood exhaust discharge shall be within a horizontal distance of 10 feet (3 m) nor directly above a building entrance.

j. Three-compartment sink - Stainless steel triple compartmented sink shall be provided for the juice bar.

1.20 COMMISSIONING OF HVAC SYSTEMS

This section contains instructions and engineering information relating to the commissioning of HVAC systems, including the pre-commissioning checks and functional performance tests. Commissioning shall begin only after all work required in paragraphs entitled "Testing, Adjusting, and Balancing of HVAC Systems" and the "Temperature Controls System" have been successfully completed, and all test and inspection reports and operation and maintenance manuals required in other Section's specifications have been submitted and approved. The commissioning of HVAC systems shall meet the requirements of Technical Specification 15995A COMMISSIONING OF HVAC.

a. Pre-commissioning Checks shall be performed for each item of mechanical equipment. Deficiencies discovered during these checks shall be corrected and retested prior to start of the Functional Performance Tests.

b. Functional Performance Tests shall be performed for each equipment item. Functional performance tests shall begin only after all

pre-commissioning checks have been successfully completed.

c. Commissioning of HVAC systems shall begin only after all work required in related sections, including Sections HVAC Control Systems and TAB of HVAC Systems has been successfully completed. All test and inspection reports and O&M manuals shall be submitted and approved before commissioning is conducted.

1.21 LIFE CYCLE COST ANALYSIS (LCCA)

The following LCCA shall be provided if the Contractor considers high efficiency boilers, water-cooled chillers for building systems, high efficient building envelope, desiccant pre-cooling of building air handling units or Photovoltaic lighting systems and shall be provided if proved to be the least life cycle cost effective

1. HVAC systems (high efficiency boilers, water-cooled chillers for building cooling).
2. High efficient Building envelope.
3. Photovoltaic Lighting.
4. Desiccant pre-cooling of all building air handling units in accordance with section 15500A DESICCANT COOLING SYSTEMS.

a. LCCA calculations and reports will be performed in accordance with WinLCCID. Computer calculations will be performed using the LCCA computer program, which conforms to WinLCCID an 10 CFR 436. Computer calculations will be performed using the LCCA computer program, using methods required for Energy Use Compliance see paragraph ENERGY USE BUDGET (EUB) COMPLIANCE CHECK. The energy to be considered will include all known thermal loads including process, ventilation and occupant loads. Operating hours will be those actually anticipated for operation. The design team will consider and evaluate all design alternatives that are feasible and appropriate for the particular design application under consideration required in other paragraphs of this Section. Special attention will be given to ensure that all feasible energy and water conservation alternatives are included in the analysis, as indicated. For each analysis the alternative with the lowest LCCA will be incorporated into the design. All economic analyses will use the energy price calculation rates furnished under Energy Prices and Discount Factors for Life-Cycle Cost Analysis. During periods of rapid change in fuel prices the average local fuel price for the previous 12 months period should be used in the analysis in lieu of the current contract price. In lieu of performing project specific individual economic studies, the designer may select alternatives on the basis of previous economic analyses or generic studies provided these studies are applicable to the project under design. In all cases, the essential elements of the design selection process including, as a minimum, the basis for which the list of feasible alternatives was developed and the basis upon which the various design decisions were reached, will be documented in the design analysis and retained in the project file. Only requested LCCA's in paragraph of this section shall be considered. Future energy values shall be based on inflation and escalation over a 25 year period in accordance with the WinLCCID USACERL program.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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SECTION 01007

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SECTION 01007

ELECTRICAL REQUIREMENTS

PART 1 ELECTRICAL DESCRIPTIONS AND NARRATIVES

1.1 GENERAL

1.1.1 References

Publications, codes, specifications and standards shall be used as the basic for the project design and shall include, but not be limited to the following:

IEEE C2	National Electrical Safety Code, 1997
NFPA 70	National Electrical Code (NEC), 1999
NFPA 75	Standard for the Protection of Electronic Computer/Data Processing Equipment, 1995
NFPA 101	Safety to Life from Fire in Buildings and Structures, 1997
NFPA 780	National Lightning Protection Code, 1992
NACE RP0169	Control of External Corrosion on Underground or Submerged Metallic Piping Systems, 1992
IES HANDBOOK	Illuminating Engineering Society Handbook, 1993
USAF Fitness Facilities Design Guide Ref. Chapter 3,D.4, and Table 4	
LIGHTING STANDARDS	Corps of Engineers Standard Lighting Fixture Details Drawing Series No. 40-06-04 http://cadlib.wes.army.mil CADD Details Library, Electrical Details USACE Standard Details 40-06-04, Oct. 97
DISTRIBUTION STANDARDS	Corps of Engineers Standard Electrical Distribution Details. http://cadlib.wes.army.mil CADD Details Library, Electrical Details Electrical Service and Distribution
ETL 94-2	Utility Meters in New and Renovated Facilities

1.1.2 STANDARD PRODUCTS

Material and equipment shall be a standard product of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. The label or listing of the Underwriters Laboratories, Inc., will be accepted as evidence that the materials or equipment conform to the applicable standards of that agency. In lieu of this label or listing, a statement from a nationally recognized, adequately

equipped testing agency indicating that the items have been tested in accordance with required procedures and that the materials and equipment comply with all contract requirements will be accepted.

1.2 COORDINATION OF ELECTRICAL CRITERIA

All electrical criteria provide in this section shall be coordinated with the architectural section, mechanical section, fire protection section, structural section, interior design section, civil and site section, and all other sections not mentioned here. The number and location of all electrical equipment indicated in the electrical requirements are approximate. Contractor design shall meet the intent of the electrical requirements provided in this section. Contractor shall coordinate the final locations of all electrical equipment with the BASE USERS to be provided by the Contracting Officer in the Field after the award of the RFP.

1.3 EXTERIOR PRIMARY ELECTRICAL DISTRIBUTION SYSTEM

The existing base primary electrical distribution system is a 13200 volt DELTA, 3-phase, 3-wire + ground, 60 Hertz underground distribution system. All new distribution primary lines will be installed underground in concrete encased duct bank with 102mm (4") conduits. Contractor shall install new primary line (in duct banks indicated above) from the existing switch to a new pad mounted transformer plus 1-102mm (4") spare. Reference sheet EU.01 and EU.02 for location. For power to the new Physical Fitness Center, Contractor shall provide a new pad mounted transformer. Contractor shall provide new duct bank and cable to tie into the existing system. Exterior primary distribution system shall be designed in accordance with Electrical Distribution System, Underground SECTION 16375a; and the requirements of this section.

1.4 EXTERIOR UNDERGROUND PRIMARY ELECTRICAL REQUIREMENTS:

1.4.1 Medium Voltage Cables

The primary cable shall be 133 percent insulated copper conductors (EPR) in concrete encased duct. Main conductors shall be no less than #4/0 A.W.G. Tap conductors shall be no less than #1/0 A.W.G. Minimum burial depth shall be 1066.8mm (3'-6") below finished grade. EPR cable insulation shall conform to the requirements of NEMA WC 8 and AEIC CS6. A 600 volt neutral shall also be installed in the same duct as the primary feeder and grounded at the pad mounted transformer.

1.4.2 Terminations and Splices

All primary load break elbows and termination kits shall be rated 15 kV and shall be 3M type or approved equal. No splices shall be allowed in manholes, instead an above ground switch (see paragraph above) shall be located at the needed splice. If a splice is allowed in special circumstances, then it shall be rated at 15 kV.

1.4.3 Pad-mounted Tamperproof Compartmental Transformers

The pad mounted transformer shall be a 13200 volt, three phase, delta-wye; oil-immersed unit (non-PCB), outdoor type with copper windings and conductors. Aluminum is not acceptable. Facility transformer shall be sized to have a minimum of 25% spare capacity above the estimated maximum demand for the building. Facility transformer shall be derated for altitude. The

transformer shall be looped fed, dead front, internally fused with the lightning arrestors installed on the loop feed with load-break elbows. See Exterior Underground Secondary Electrical Distribution Requirements for pad transformer secondary distribution voltages. Transformer pad shall extend 254.0mm (10") beyond the edge of the transformer furnished. Provide grounding conductor counterpoise around transformer pad and a grounding rod at each corner of the counterpoise with a minimum of two ground connections between the transformer and the counterpoise.

1.5 EXTERIOR UNDERGROUND SECONDARY ELECTRICAL DISTRIBUTION REQUIREMENTS.

Exterior secondary electrical distribution system to the Physical Fitness Center shall be 480Y/277 volt, 3-phase, 4-wire underground feeder in conduit to a Main Distribution Panel (MDP)/Panelboard located in the electrical room. Main facility feeder and main distribution panel shall be sized to have a minimum of 25% spare capacity above the estimated maximum demand for the building. Design of the exterior secondary electrical system shall be in accordance with Electrical Distribution System, Underground - SECTION 16375a and the requirements of this section.

1.5.1 Underground Service Entrance/Feeder/Branch Circuits.

Service entrance conductors, branch and feeder circuits shall be single conductor conductors, Type THW, THWN, or USE in accordance with NFPA 70. Service entrance conductors and underground feeder/branch circuits shall be copper conductors with insulating grounding conductor in GRS conduit. Aluminum conductors and direct buried cables are NOT acceptable.

1.5.1.1 Conduits

Conduits shall be rigid galvanized steel (RGS) within 1524 (5') if the building foundation and schedule 80 PVC elsewhere. Conduits shall be non-encased direct-burial for low voltage circuits. Top of conduit shall be 914.4mm (36") below finished grade.

1.6 EXTERIOR LIGHTING SYSTEM.

Area lighting shall be provided for all parking lots, walkways, above all exit doors, and area signage. Lighting fixtures shall utilize high pressure sodium lamps. Pole/fixture heights shall be no greater than 12.2 meters (40 feet) above finished grade. Poles/fixtures shall match existing poles/fixtures on BASE as to height and style. Fixture/pole finish shall be anodized bronze to match existing lighting pole finishes. The design of the lighting poles shall take into consideration that the yearly average maximum wind speed (50 year average) is 144.9km/h (100 miles per hour). Design shall be in accordance with IES Handbook, Exterior Lighting Specification SECTION 16528a, Electrical Distribution System, Underground Specification SECTION 16375a and the requirements in this section.

1.6.1 Area Lighting

Area lighting shall be provided for all areas noted above. Lux/footcandle levels for the parking lot lighting shall be 5 lux/0.5 fc measured at 152.4mm (6") above finished grade. Area lighting contactors and controls for the building shall be installed in the electrical rooms. Exact location of lighting controls shall be coordinated with the USER during the design of the project. Area lighting control shall as referenced in paragraph "Lighting Control" below.

1.6.1.1 Walkway Lighting

Walkway lighting fixtures shall be bollard type. Walkway lighting bollards shall be placed along walkway and between walkway and parking lot to block parking lot traffic from side walk access. Lamps shall high pressure sodium and shall be sized to meet lighting criteria. The bollards shall match existing fixtures installed on base. Walkway lighting control shall be as referenced in paragraph "Lighting Control" below.

1.6.1.2 Parking Lot Lighting

Parking lot lighting fixtures shall be single arm or double arms mounted on aluminum poles. Lamps shall be high pressure sodium and sized to meet lighting criteria. Fixtures and poles shall match existing installed on base. Poles shall not be located within the parking lot areas. Poles shall be located outside the parking lots behind the curbs. Parking lot lighting control shall be as referenced in paragraph "Lighting Control" below.

1.6.1.3 Exterior Building Lighting

Exterior building lighting fixtures shall shall match existing installed on base. Lamps shall be high pressure sodium and sized to meet the lighting criteria. Fixtures shall be mounted at each entrance for the building. Exterior building lighting control shall be as referenced in paragraph "Lighting Control" below.

1.6.2 Lighting Control

Provide disconnect switch with HAND-OFF-AUTOMATIC switch and lighting contactors for exterior lighting controls. Lighting contactors shall be controlled from a photocell and time clock through the automatic leg of the HOA switches. Install lighting controls in the electrical room or otherwise indicated in this section. Lighting controls installed outside the electrical rooms shall be in weatherproof enclosures. Install lighting controls per requirements of this section. Exact location of all lighting controls shall be verified with the USER during design of the project.

1.6.3 Underground Lighting Circuits

Provide underground branch circuits for all exterior lighting circuits. Branch circuits shall be insulated copper conductors with insulated grounding conductor in conduit. Aluminum conductors are NOT acceptable. Direct buried conductors are NOT acceptable. All underground lighting conductors shall be in rigid galvanized steel (RGS) conduit within 1524mm (5') of the building foundation and schedule 80 PVC elsewhere. Top of conduit shall be 914.4mm (36") below finished grade.

1.6.3.1 Lighting Pole Grounding

All exterior lighting poles shall be grounded at the base of the pole. Provide a 19.05mm (3/4") x 3048.0mm (10 feet) copper glad grounding rod at each pole.

1.6.3.2 Conductors

Cables shall be type USE conforming to UL 854, with copper conductors and type RHW or XHHW insulation conforming to UL 44, and shall include green ground conductor. Cable shall be provided with insulation of a thickness not less than that given in TABLE 15.1 of UL 854. Cable shall be rated for

600 volts. Parts of the cable system such as splices and terminations shall be rated not less than 600 volts. Conductors larger than No. 9 AWG shall be stranded.

1.6.3.3 Conduits

Conduits shall be single, round-bore type, with wall thickness and fittings suitable for the application. Conduits shall be non-encased direct-burial, thick wall for low voltage lighting circuits.

1.6.4 Building Lighting Circuits

All exterior fixtures mounted on the surface of the building shall be wired from within the building and shall conform to the Interior Wiring Methods paragraph of this section. No building lighting circuits shall be surface mounted.

1.7 EXTERIOR GOVERNMENT COMMUNICATION DISTRIBUTION SYSTEM

This design shall be in accordance with the Telephone System, Outside Plant Specification SECTION 16711a, Electrical Distribution System, Underground Specification SECTION 16375a and the requirements of this section.

1.7.1 Communications Ductbank

Contractor shall provide new ductbank and connect the new Physical Fitness Center communications room to an existing communication manhole located as shown on sheet EU.01 and EU.02. Existing communications manhole shall be modified to match the new grade and vehicle loading requirements. New duct bank shall consist of 2-4" conduits. One 4" conduit shall contain 4-1" inner ducts. One-1" inner duct shall contain 50-pair telephone cable and 1-1" shall contain a 12 strand multimode fiber optic cable. The remaining 4" conduit and the 1" inner ducts shall be spares with pullwires.

1.7.2 Telephone Distribution.

Provide 50 pair telephone cable (cat. 5e copper) from the existing communications manhole to the new communications room. Provide 4" galvanized rigid steel conduit for protection of cable where exposed on walls between communications rooms in the Physical Fitness Center. Contractor shall coordinate connection requirements with the Base Communications Department.

1.7.3 LAN Distribution.

Provide 6 multimode fiber optic cable for LAN connectivity (CITS) from the Physical Fitness Center communications room to the existing communications manhole. Provide 6 fiber strand, multimode, fiber optic cable for this application. Terminate fiber optic LAN cable in a fiber optic patch panel. Provide ST type connectors for terminations. Six strands shall be labeled for LAN use.

1.7.4 Fire Alarm Distribution.

Fire alarm shall be provided with antenna as per Manufacturers (King Fisher) recommendations.

1.7.5 EMCS Distribution.

Provide 6 multimode fiber optic cable for future EMCS connectivity from the Physical Fitness Center communications room to the existing communications manhole. Provide ST type connectors for terminations. Six strands shall be labeled for EMCS use.

1.8 CATHODIC PROTECTION SYSTEM

A sacrificial anode cathodic protection system shall be provided for all underground metallic lines, fittings, valves and fire hydrants. In addition to the anodes, all metallic pipes must be provided with a coating system. The systems shall be designed and installed in accordance with NACE RP 169 Standards. Criteria for determining the adequacy of protection shall be in accordance with NACE RP-01-69 and shall be selected by the corrosion engineer as applicable. Design shall be in accordance with Cathodic Protection System, (Sacrificial Anode) - Specification SECTION 13110 and the requirements of this section. At least one test station shall be provided on each valve, fire hydrant and metallic pipe.

1.9 UNDERGROUND CABLE MARKINGS

A color-coded plastic warning tape shall be placed at least 101.6mm (4") wide within the trench above all buried utility lines. RED shall be supplied for the buried electrical lines and ORANGE shall be supplied for all the buried communication lines.

1.10 INTERIOR ELECTRICAL DISTRIBUTION SYSTEM

The interior secondary distribution voltage within the building shall be 480Y/277 volt, 3-phase, 4-wire. Conductors shall be copper. Aluminum is not acceptable. The higher voltage (480 volts, 3-phase) shall be used for larger motor loads, equipment loads and all other required loads. The lower voltage (277 volts, 1-phase) shall be used for all the lighting loads. Provide step down transformers for all receptacle loads, small motor loads, computer loads, and all other loads as required. Step down transformers shall have a 25% spare capacity for future loads. Transformer windings and conductors shall be copper. Aluminum is not acceptable. Transformers that serve non-linear loads such as the computer receptacles shall have K-rated transformers. Design shall be in accordance with Electrical Work, Interior - Specification SECTION 16415a and the requirements of this section.

1.10.1 Service Equipment

Service equipment/disconnecting means shall be provided in the Main Distribution Panel (MDP)/Panelboard/(s) located in the electrical room. Service disconnect means shall be of the insulated-case circuit breaker type. Secondary surge protection shall be provided at the Main Distribution Panel.

1.10.1.1 Main Distribution Panel (MDP)/Panelboard

Main Distribution Panel (MDP)/panelboard shall be in a metal-enclosure. Service disconnect circuit breaker shall be of the insulated-case circuit breaker type. Branch circuit breakers shall be molded-case type circuit breakers, except that branch circuit breakers 200 amp trip and larger shall be insulated-case type. Enclosure shall be ventilated general purpose type wall mounted type. Busses for the Main Distribution Panel (MDP) and all panelboards shall be copper only. Aluminium shall not be allowed. Each phase, neutral and equipment grounding bus shall be clearly shown on the

drawings. Short circuit rating of all busses shall be clearly indicated on the drawings.

1.10.1.2 KWHR Meter

Metering shall comply with Engineering Technical Letter (ETL) 94-2: Utility Meters in New and Renovated Facilities. KWHR meters with 15 minute demand registers shall be provided for recording power consumption of the facility. Meters shall be provided with pulse initiators for connection to the BASE EMCS - (Energy Monitoring and Control System).

1.10.1.3 Protective Coordination Study

A full protective coordination study to include overcurrent and short current analysis shall be done on the electrical distribution system for the building. The study shall include the interior electrical distribution system and primary distribution system back to the existing primary line.

1.10.2 Panelboards

Lighting and appliance branch-circuit panelboards shall be of the circuit breaker conforming to NEMA AB-1 and UL 489 and shall be located in the electrical room.

a. Load-center type panelboards and half size breakers shall not be allowed.

b. Panelboard shall not exceed 1981.2mm (78") in height from the finished floor.

c. All panelboards shall have a minimum of 25 percent spare capacity for all loads. Panelboards shall have a minimum of 25 percent spare circuit breakers. Spare circuit breakers shall be redundant of the type of circuit breaker being provided in the panelboard.

d. Panelboard busses shall be copper only. Aluminum busses are not acceptable.

1.10.3 Motors

Motors shall be of sufficient size for the duty to be performed and shall not exceed the full-loading rating when the driven equipment is operating at specified capacity under the most severe conditions encountered.

a. All motors shall have open frames and continuous-duty classification and be based on a 40 degree C ambient temperature reference.

b. All motors shall be derated for altitude.

c. All permanently wired polyphase motors of 747 watts or more shall meet the minimum full-load efficiencies as indicated in the Electrical Work, Interior Specification Section 16415a.

1.10.4 General Purpose Receptacles

Duplex receptacles for general purpose applications shall be 20 amp, 125 volt, 2-pole, 3-wire grounding type. A maximum of five duplex receptacles may be connected to a receptacle circuit. Receptacle circuits shall not supply lighting loads. General purpose duplex receptacles shall be located

in the facility as follows:

a. Provide general duplex receptacles every 3.65 meters (10') along the walls in all areas of the building. For small rooms that do not have 3.65 meter (10') walls, a minimum of one (1) outlet shall be installed on each wall. Receptacles shall be mounted 381mm (15") above finished floor.

b. Provide a general purpose duplex receptacle adjacent to each mirror for each sink position located in the bathrooms. Where mirrors are located other than above sinks, provide additional receptacles to accommodate hair dryers. Receptacles shall have (GFCI) ground fault circuit interrupters. Mount receptacles 1219.2mm (48") above finished floor.

1.10.5 Special Receptacles

Ground Fault Circuit Interrupter (GFCI) receptacles shall be provided in all rest rooms, sink countertops, janitor's closet and other wet locations. Weatherproof receptacles for exterior use, shall be mounted in a box with a gasketed, weatherproof, cast-metal cover plate and gasketed cap over each receptacle opening with (GFCI). Exact location of the receptacles noted below shall be coordinated with the USER during the design of this project. Provide 20 amp, 125 volt, 2-pole, 3-wire grounding type, duplex receptacles in the following locations:

a. Provide duplex receptacles for all vending machines to be installed by the government in the vending areas.

b. Provide a single receptacle for each electric water cooler.

c. Provide duplex receptacles for the government furnished and government installed copier and fax machine in the General Office.

d. Provide duplex receptacles for the government furnished and government installed copier and fax machine in the Manager Office.

e. Provide a duplex receptacle with ground fault circuit interrupter on the exterior of the building adjacent to each exit door of the building. Mount receptacles 609.6mm (24") above finished grade.

f. Provide two (2) duplex outlets every 1828.8mm (72") along each wall in the Electrical/Communications Room. Outlets shall be 20A, 125 volt, duplex outlets with dedicated branch circuits. Receptacles shall be installed 381mm (15") above finished floor.

g. Provide six (6) duplex outlets for TVs, equally spaced along the ceiling near the TV mounting brackets in the Cardiovascular Room. Outlets shall be 20A, 125 volt, duplex outlets with dedicated branch circuits. Receptacles shall be installed 152.4mm (6") below ceiling, flush mounted on wall. Coordinate exact location with User.

h. Provide one (1) dedicated 20 amp, 125 volt duplex receptacle for each future EMCS OR DCC panel. Each receptacle provided for the EMCS panels shall have a dedicated branch circuit.

i. Provide one (1) dedicated 20 amp, 125 volt duplex receptacle for the LAN rack. Receptacle provided for the LAN rack shall have a dedicated branch circuit and ground.

j. Provide one (1) single floor outlet under each piece of equipment in the Cardiovascular Room that requires power. Outlets shall be 20A, 125 volt, single outlets with dedicated branch circuits. Receptacles shall be installed flush in the floor. See paragraph 1,10.7a below for additional requirements. Coordinate exact location with User.

1.10.6 Computer Outlets

Computer outlets shall be duplex, 20 amp, 125 volt, 2-pole, 3-wire grounding type receptacles. A maximum of three duplex computer outlets shall be connected to a receptacle circuit. Circuits shall be sized using 600 volt-amp per computer. Neutral conductors (#10 minimum) shall be sized at 133% of the phase conductors. Computer outlets shall be labeled as "COMPUTER". Mount the outlets 381mm (15") above finished floor. Computer outlets shall be mounted adjacent to the Telephone/Data outlets. Maintain a separation of 152.4mm (6") from the Telephone/Data outlets. Exact location of all Computer Outlets shall be verified and coordinated with the USER during the design of the project. Computer outlets shall be located in the buildings as follows:

1.10.6.1 Computer Outlets - (Locations)

Computer outlets shall be located as follows:

ROOM NAME	QUANTITY OF OUTLETS
113 ERGOMETRY STATION	2
114 ERGOMETRY STATION	2
115 ERGOMETRY STATION	2
116 ERGOMETRY STATION	2
117 ERGOMETRY STATION	2
118 ERGOMETRY STATION	2
119 ERGOMETRY STATION	2
120 ERGOMETRY STATION	2
121 WELLNESS ASSESSMENT	2
122 WELLNESS ASSESSMENT	2
123 OFFICE	3
124 OFFICE	3
CORRIDOR OUTSIDE RMS 123 & 124	1
126 RECEPTION	2
127 LIBRARY/WAITING	2
128 OFFICE	3
129 COMPUTER LIBRARY	5
135 FOOD DEMONSTRATION	2
136 CLASSROOM	5
141 GYMNASIUM	2
174 POOL OFFICE	3
183 STAFF BREAK ROOM	2
184 STAFF OFFICE	3
186 STAFF OFFICE	3
187 STAFF OFFICE	3
188 CONTROL COUNTER	3

1.10.7 Other Loads

Contractor shall provide electrical power to the following loads either by

receptacle or direct wired as applicable:

a. Cardiovascular Room Fitness Equipment: Contractor shall provide power connections as required for Government Furnished Equipment including treadmills - 220 VAC, steppers - 120 VAC, recumbent bikes - BATTERY, upright bikes - BATTERY, elliptical total body trainers - 120 VAC, stepmill - 120 VAC, versaclimber - BATTERY, and nordictrack - BATTERY according to the layouts shown on the architectural floor plan. Each item of equipment shall be powered by flush mounted floor receptacles located under equipment so as to eliminate Users tripping on equipment power cords. Each piece of equipment shall be on a separate circuit. For additional equipment information contact SSgt. Ron Stelly @ 303-677-6679.

b. Laundry Equipment: Contractor shall provide power receptacles as required for two (2) commercial washers and two (2) commercial dryers in the Storage/Laundry Room. Provide 220 VAC power for laundry equipment.

c. Contractor shall provide power connections for power hoists to raise the end of court baskets.

d. Contractor shall provide power connections for six (6) scoreboards, six (6) shot clocks and associated controllers. Scoreboards, shot clocks and associated controllers shall also be provided by the Contractor.

e. Contractor shall provide all power connections as required for six (6) ceiling mounted televisions in the Cardiovascular Room and 1 (one) in the HAWC waiting area.

f. Contractor shall provide all power connections and conduit as required for the Sauna equipment.

g. Contractor shall provide all power connections and conduit as required for the Elevator.

h. Contractor shall provide all power connections, control and conduit as required for the motorized screen and projection equipment located in Class Room 136.

1.10.8 Architectural/Mechanical Connections

Contractor shall provide branch circuits, disconnect switches, magnetic starters, and all other related electrical equipment and material for all architectural, mechanical equipment and environmental equipment to be installed in the project (includes the facility and site). This shall include all hair dryers, HVAC units, unit heaters, pumps, exhaust fans, and all other mechanical equipment in the facility. Urinals, sinks, and blow dryers shall be controlled by passive infrared sensors hard wired to the building electrical distribution system. No batteries shall be allowed for this purpose. Contractor shall coordinate this electrical requirement with the architectural and mechanical requirements.

1.11 INTERIOR LIGHTING SYSTEM

The interior design shall be in accordance with the requirements in this section, the IES Handbook, the "Electrical Work, Interior" Specification - SECTION 16415a, and the requirements in this section.

1.11.1 Illumination Levels

Maintained illumination levels shall generally not be less than the values listed in the table below.

ROOM TYPE	INTENSITY [lux/(fc)]
Group Exercise Rooms	540/50
Cardiovascular	540/50
Ergometry Stations	540/50
Wellness Assessment	540/50
Food Demonstration	540/50
Corridors	160/15
Electrical/Communications Room	325/30
Gymnasium	540/50
Janitor Closet	55/5
Laundry	325/30
Lobby	215/20
Locker Rooms	325/30
Mechanical Rooms	325/30
Offices Areas	540/50
Racquetball	540/50
Restrooms	325/30
Stairways	160/15
Storage Rooms	55/5
Track	540/50
Vestibule	160/15
Swimming Pool	540/50

At the Reception Desk Room 126, Juice Bar Room 103 and Control Counter 188, Contractor shall provide task lighting mounted under the counter and accent lighting mounted above and around the perimeter of the counter. Accent lighting shall consist of pendant mounted fixtures with compact fluorescent lamps. Fixture color and style shall be coordinated with Architectural and Interior Sections.

In the Food Demonstration Room 135 and Classroom 136 provide accent lighting for presentations. Accent lighting shall consist of recessed downlights on dimmers.

1.11.2 Conservation Requirements

Contractor shall incorporate into the Facility Lighting system Green Technology. Contractor shall optimize building performance by the use of occupancy sensors and the use of sensors to control loads based on the availability of natural light. Illumination levels, in conjunction with energy conservation, shall be obtained by the most life cycle cost-effective techniques including, but not limited to, the following:

- a. Provide multiple switching of multi lamp fixtures or multiple switching of fixture groups in large rooms, or both, to permit lighting fixtures to be turned off in unoccupied areas.
- b. Provide energy efficient lamps and solid-state electronic ballasts.

1.11.3 Fluorescent Fixtures

Fluorescent light fixtures with T8, 34 watt lamps shall be used in all

areas of the building, except the Gymnasium, Racquetball Courts, Cardiovascular Room and Swimming Pool. Fluorescent light fixtures in the Gym, Racquetball Courts, Cardiovascular Room and Swimming Pool shall use Intrepid Lighting Manufacturing, Inc PMD Series "Maxi-9" utilizing nine F39BX compact fluorescent lamps. For additional information on this product dial (1-800-352-2852). Fluorescent light fixtures in Offices, Ergometry, Wellness Assessment, etc, shall use 3 lamp, parabolic reflectors with silver finish to reduce glare (type RF12 - Corps of Engineers Std. Det. Dwg. No. 40-06-04). Offices shall be provided with multi-level switching (33%-66%-100%). Fixtures in other areas such corridors, restrooms, weight room, lobby, storage/laundry, locker rooms, aerobics room, etc. shall be 2 or 3 lamp fluorescent type fixtures with parabolic louvers - silver finish (type RF12 - Corps of Engineers Std. Det. Dwg. No. 40-06-04). Acrylic lenses shall not be used. Fixtures in utility areas such mechanical rooms, electrical/ communications room, storage rooms, and janitor's closet shall be industrial fluorescent type fixtures with open reflectors. All ballasts shall be of the energy saving electronic type with power factor correction to exceed 90%.

1.11.4 Incandescent Lighting Fixtures.

Incandescent lighting fixtures shall NOT be used.

1.11.5 Gymnasium/Cardiovascular Lighting Fixtures

Gym/Cardiovascular lighting fixtures shall be enclosed, pendant, industrial, Intrepid Lighting Manufacturing, Inc PMD Series "Maxi-9" utilizing nine F39BX compact fluorescent lamps and three rapid start electronic ballasts. Fixtures shall be provided with shatter proof lenses or metal guards for breakage protection. Lighting shall be designed with three lighting levels (high-medium-low) for maximum energy conservation.

1.11.6 Racquetball Courts Lighting Fixtures

Racquetball lighting fixtures shall be enclosed, industrial, Intrepid Lighting Manufacturing, Inc PMD Series "Maxi-9" utilizing nine F39BX compact fluorescent lamps and three rapid start electronic ballasts. Lighting shall be designed with three lighting levels (high-medium-low) for maximum energy conservation. Fixtures shall be recessed into ceiling so that lenses are flush mounted with the ceiling. Fixtures shall be provided with shatter proof lenses or metal guards for breakage protection.

1.11.7 Egress and Exit Lighting Fixtures

Egress and exit lighting design shall be in accordance with NFPA 101. Egress and exit lighting fixtures shall be powered from a central battery/inverter system located in the electrical room to meet USER requirement. Exit lights shall be LED (green on white) type XL1 - Corps of Engineers Std. Det. Dwg. No. 40-06-04. Egress lighting fixtures shall be provided from room fluorescent light fixtures through out the facility.

1.11.8 Swimming Pool Lighting Fixtures

Swimming Pool lighting fixtures shall be enclosed, industrial, Intrepid Lighting Manufacturing, Inc PMD Series "Maxi-9" utilizing nine F39BX compact fluorescent lamps and three rapid start electronic ballasts. Swimming Pool lighting shall be designed with three lighting levels (high-medium-low) for maximum energy conservation. Fixtures shall be provided with shatter proof lenses or metal guards for breakage protection.

For maintenance purposes fixtures shall not be mounted over the pool.

1.12 INTERIOR COMMUNICATION SYSTEM

1.12.1 General

All telephone/data/LAN outlets shall be provided with three 8-position jacks (RJ45), 1 each for voice/data/LAN. Outlets shall be Superior Modular with interchangeable bezels. Color code and type of bezels is as follows: voice-white RJ-11 bezel; data-gray RJ-11 bezel; LAN-green RJ-45 bezel. Connect all telephone/data/LAN outlets from the telephone terminal backboard in the communications room with three 4-pair, EIA/TIA Category 5e, unshielded twisted pair (UTP) solid copper station cable. Color code for Category 5e cable shall be white for voice, gray for data and blue for LAN. Connect all single 8-position type wall outlets from the telephone terminal backboard with one 4-pair, EIA/TIA Category 5e, UTP solid copper station wire. The wiring configuration shall comply with TIA/EIA 568B. Telephone/data/LAN wiring shall be terminated using RJ-45 jacks. AMP "Net Connect" or equivalent termination boxes will be used as practical. Telephone and data lines shall be terminated on category 5e patch panels in the communications room. LAN wiring shall be terminated on 19" communication racks (grounded) to include category 5e patch panels and cable organizers located in communication rooms. ERGO area shall be on a separate communications hub with equipment installed in communications room. All communications homeruns from the ERGO Rooms shall terminate on the ERGO hub. All electronic devices (computers, file servers, hubs, concentrators, phones, etc.) are not part of this contract and will be installed by the USER. Each facility design shall be in accordance with Premises Distribution System Specification - SECTION 16710a, Electrical Work, Interior Specification SECTION 16415a and the requirements of this section.

1.12.2 Telephone Terminal Backboard

Provide a 19.05mm (3/4") plywood backboard in a NEMA 1 steel enclosure on the wall in the Electrical/Communications Room. Provide surge arrestors and Building Entrance Terminal (BET) type blocks for the incoming telephone conductors (line side). Provide a separate set of 110 type cross connect blocks for landing the facility telephone conductors (house side). The plywood telephone backboard shall be provided with a fire retardant coating. Contractor shall coordinate location of incoming telephone service with the location of the surge arrestors, Building Entrance Terminal (BET) type blocks and type 110 cross connect blocks on the telephone backboard. In communication rooms telephone and data lines shall be terminated on Category 5e patch panels. All underground conduits entering the Communication Room shall be stubbed up 152.4mm (6") above finished floor adjacent to the telephone backboard. Provide 101.6mm (4") galvanized rigid steel conduit for protection of 50 pair telephone cable where exposed on walls in the Communications Room.

1.12.3 Telephone Conductors/Conduits

Copper cables shall be 24 gauge, 4 pair, EIA-TIA 568A Category-5e, unshielded twisted pair (UTP) solid copper station cable. Terminate cables on jacks with EIA 568B sequencing. All telephone conductors shall be installed in conduits or cable trays per Wiring Methods paragraph in this section. Cables shall be color coded white for voice, grey for data and blue for LAN.

1.12.4 Telephone/Data/LAN Outlets

Telephone/data/LAN outlets shall consist of one (1) telephone jack, one (1) data jack and one (1) LAN jack. Telephone jacks, data and LAN jacks shall be installed in the same junction box. Telephone jacks shall be used for voice communication and the data and LAN jacks shall be used for base and external LAN connections. Telephone jacks shall be white in color and labeled as "VOICE". Data jacks shall be gray in color and labeled as "DATA". LAN jacks shall be green in color and labeled as "LAN". Each outlet shall be "Superior" brand or an approved equal mounted 381mm (15") above finished floor. Provide telephone/data/LAN outlets at each of the locations indicated in the following paragraphs. Locations of all outlets shall be coordinated with the furniture placement and the User.

1.12.4.1 Telephone/Data/LAN Outlets - (Locations)

Outlets of the listed type and quantities shall be located as follows:

Type of outlet- Telephone/Data/LAN

ROOM NAME	QUANTITY OF OUTLETS
113 ERGOMETRY STATION	2
114 ERGOMETRY STATION	2
115 ERGOMETRY STATION	2
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a. Provide one (1) floor mounted flush telephone/data outlet in the floor under each piece of exercise equipment in Cardiovascular Room.

1.12.5 Telephone Single Outlets

Each single telephone outlet shall have one (1) telephone jack installed in a single junction box. Telephone single jacks shall be white in color. Outlets shall be mounted at 1219.2mm (48") above finished floor. Wall plates shall be suitable for mounting standard wall phones. Provide outlets

at the following locations:

1.12.5.1 Telephone Single Outlets - (Locations)

Outlets of the listed type and quantities shall be located as follows:

Type of outlet- Telephone

ROOM NAME	QUANTITY OF OUTLETS
102 LOBBY/WAITING	1
105 SM. GROUP EXERCISE	1
106 SM. GROUP EXERCISE	1
107 LG. GROUP EXERCISE	1
127 LIBRARY/WAITING	1
139 WEIGHT ROOM	1
140 MECHANICAL EQUIP.	1
141 GYMNASIUM	2
163 ELECTRICAL	1
166 COMMUNICATIONS	1
202 CARDIOVASCULAR	1
ELEVATOR	1

1.13 CROSS CONNECT CABLES

Provide 50 pair #24 AWG telephone cables with 100 pin connectors at each patch panel and punch down the other end of the cable at the cross-connect blocks. Support all telephone cables by ladder cable trays in the Communications Room.

1.14 FIBER OPTIC PATCH PANELS

Fiber optic patch panels for the multi-mode fiber shall be wall mountable enclosures. Incoming fiber-optic cables shall be terminated at the rear of the patch panel with ST type connectors.

1.15 COMMUNICATION GROUNDING

All exposed non-current carrying metallic parts of the telephone equipment, cable sheaths, cable splices and terminals shall be grounded. Contractor shall provide a Master Ground Bus (MGB) in the Electrical/Communication Room per Premises Distribution System - Specification Section 16710a.

1.16 PUBLIC ADDRESS (PA)/INTERCOM SYSTEM

Building design shall provide control panel, PA speakers located throughout the facility and shielded category 5e wire and conduit from speaker locations back to Electrical/Communications room. A shielded category 5e cable shall be run from the Electrical/Communications Room and daisy chained from the PA system rack to each PA speaker locations, leaving a short coil of wire at the location of each speaker for connection. The category 5e cable will provide both power and signal to each speaker. Speakers will be provided and installed throughout the Facility as required to provide complete coverage. Coordinate speaker locations and zoning with the User. Speakers (Velcom Brand) will be provided and installed. Speakers

are ceiling grid mountable type. At the scorers tables in the Gym provide outlets and microphones for connection to the PA system. For medical emergencies a wall mounted speaker with controls will be provided in each of the following rooms to allow hands free voice communication to the Reception Area Room 188.

- 1-Large Group Exercise
- 1-Small Group Exercise
- 1-Small Group Exercise
- 2-Free Weight Room
- 2-Swimming Area
- 2-Upstairs Running Track
- 4-Basketball Court
- 4-1 Each Racquetball Court (flush mounted)
- 1-Juice Bar Area
- 1-Managers Office
- 2-Cardiovascular

All components of public address system such as individual room controls, rack equipment...etc. will also be furnished and installed by the Contractor. Facility public address system will be connected to the base public address system via the telephone system.

1.17 CLOSED CIRCUIT TELEVISION SYSTEM

Closed circuit television system is required for this facility. System shall consist of Contractor furnished and installed empty conduit and J-boxes.

Closed circuit television equipment will be furnished and installed by Others. Contractor shall provide from the Reception Area Rm 188, conduit and J-boxes for the following number of cameras to each of the listed rooms:

- 1-Large Group Exercise
- 1-Small Group Exercise
- 1-Small Group Exercise
- 2-Free Weight Room
- 2-Swimming Area
- 2-Upstairs Running Track
- 4-Gymnasium
- 4-1 Each Racquetball Court
- 2-Cardiovascular

Contractor shall verify with the User the exact locations of each camera.

1.18 TELEVISION

Six (6) coaxial connector jacks (residential type) shall be provided in the Cardiovascular Room and 1 (one) shall be provided in the HAWC waiting area. Mount receptacles on the ceiling, flush mounted, near the TV mounting brackets. Coordinate location with power outlets and User. Provide coaxial cable in conduit from each outlet to a television cabinet located in Comm Room 166. Provide 1828.8mm (6') excess conductor in Comm Room. TV Satellite dish and connection to coaxial cable is by others. Contractor shall provide 2" conduit stub-outs for connection to satellite and cable TV. Coordinate location of stub-outs with User. Contractor shall also provide a headphone connection at each fitness equipment location in the Large Exercise Room (see floor plan). Headphone connections shall allow selection of any of the six TV's audio signals and shall provide for volume control. Headphones shall be included. See also paragraph "SPECIAL RECEPTACLES" for power

requirements.

1.19 EMCS (ENERGY MONITORING AND CONTROL SYSTEM)

The building shall be wired for future EMCS (Energy Monitoring and Control System). All EMCS sensors will be installed per Mechanical specifications. See Mechanical Section 01006 for EMCS options and requirements. Provide 4 pair #24 AWG telephone conductors in 27mm conduit from each EMCS OR DDC panel to the telephone patch panels located in the Electrical/Communications Room. Provide power as required for all EMCS or DDC components (such as dampers, VAV boxes, control panels, etc.) requiring power.

1.20 WIRING METHODS

Wiring shall conform to the latest edition of NFPA 70, Electrical Work, Interior Specifications SECTION 16415a and the requirements of this section.

1.20.1 Power Conductors

Conductors shall be copper only. Aluminum conductors are not allowed. Minimum conductor size shall be #12 A.W.G. Conductors shall be installed in conduits. Power and lighting conductors shall be 600 volt, Type THHN (in dry locations), and THW or THWN (in wet locations). Conductors no. 8 AWG and smaller shall be solid. Conductors no. 6 AWG and larger shall be stranded. Cabling systems such as Mineral-Insulated cables, metallic armored cables and nonmetallic-sheathed cables shall not be allowed on this project.

1.20.2 Communication Conductors

Communication conductors shall be provided per paragraph "INTERIOR ELECTRICAL DISTRIBUTION SYSTEM" of this requirement and Premises Distribution System, Specification Section 16710a.

1.20.3 Conduits

Wiring shall consist of insulated conductors installed in rigid zinc-coated steel conduit or electrical metallic tubing. Plastic conduit is allowed only underground or under the floor slab. Raceways shall be concealed within finished walls, ceilings, and floors.

1.21 GROUNDING SYSTEM

The grounding system shall be designed in accordance with NEC Article 250 and the following criteria. In general, all metallic building components including reinforcing steel and miscellaneous metals shall be part of an electrically continuous ground system. Steel studs used in interior wall construction, T bars of the ceiling grid, diffusers of the air distribution system, and door hardware are exempt from this bonding requirement. Bonding shall be by exothermic welding or the brazing of a copper wire between components. Design shall be in accordance with Electrical Work, Interior Specification - SECTION 16415a and this section.

1.21.1 Communication Grounding System

Grounding for the main telephone service shall be provided by installing an insulated #6 copper grounding conductor in 27mm (1") conduit from the Master Grounding Bus located in the Communication Room to the building

service ground.

1.21.2 Grounding Conductors

A green equipment grounding conductor, sized in accordance with NFPA 70 shall be provided, regardless of the type of conduit. Equipment grounding bars shall be provided in all panelboards. The equipment grounding conductors shall be carried back to the service entrance grounding connection or separately derived grounding connection. Grounding conductors shall be provided in all branch including lighting circuits and feeders circuits.

1.21.3 Earth Electrode System

The maximum resistance measure in accordance with IEEE Std 81 of a driven ground rod shall not exceed 25 ohms under normally dry conditions. Ground rods shall be 19.05mm (3/4") x 3048mm (10') copper clad ground rods.

1.22 LIGHTNING PROTECTION SYSTEM

NFPA 780, Appendix H - Risk Assessment Guide conducted for this building indicates a risk (R) between 6 and 8 which is in the moderate to severe category. Based on this assessment, the Contractor shall provide a lightning protection system in accordance with LIGHTNING PROTECTION SYSTEM - SECTION 13100a and NFPA 780. Lightning protection system provided shall include but not limited to air terminals, main conductors, concealed down conductors, bonding conductors, and 19.05mm (3/4") x 3048mm (10') ground rods interconnected by a counterpoise routed around the perimeter of the building. All connections below grade, to main conductor and down conductor shall be by exothermic weld process. Alternate bonding methods will be allowed to metal bodies (vent hoods, exhaust stacks...) which have light enough weight to make exothermic welds impractical.

1.23 FIRE DETECTION AND ALARM SYSTEM

The fire detection and alarm system requirements are provided in Fire Protection SECTION 01008. Design shall be in accordance with Fire Detection and Alarm Specification, Addressable - SECTION 13851a and the requirements of Fire Protection SECTION 01008. Fire alarm system shall be addressable to each device. Hybrid systems which have addressable loops are NOT acceptable. Fire alarm transmitter shall be addressable, King Fisher KFAPT. All alarms/status conditions for each device shall report back to the BASE Fire Department. Contractor shall provide all programming required at the Physical Fitness Center and at the BASE Fire Department to accommodate the Physical Fitness Center fire detection and alarm system. A local graphic annunciator shall be located in the Vestibule 101.

Notwithstanding Section 00700 Contract Clauses FAR 52.236-5, Material and Workmanship, the Fire Detection and Alarm System shall be manufactured by King Fisher in order that compatibility with the existing Buckley AFB Fire Detection and Alarm System be maintained. No other product will be acceptable. The Competition Advocate authorizes sole source procurement.

1.24 GYMNASIUM SCOREBOARD EQUIPMENT

The Contractor shall furnish and install six (6) scoreboards, six (6) scoreboard controllers, six (6) shot clocks and all associated wiring including wiring to a central point near the center of each court for control from a scorers table. The scoreboards shall show basic game

information including time, scores, period, possession indication, and bonus indication. Scoreboards shall have 13" letters with bar type digits. LED models only shall be provided. Timing to 1 tenth-of-a-second shall be provided. Scoreboards shall be Daktronics model BB-1813-9 or an approved equal. The scoreboards shall be mounted and located as per Manufacturer's recommendations and User requests.

1.25 TESTING

Contractor shall provide all testing required by all specifications provided to the Contractor. Testing shall include low voltage conductors, high voltage conductors and communication conductors and all other mandatory testing required by the specifications provided with this section.

1.26 TRAINING

a. Training courses shall be conducted for five (5) operating staff members designated by the Contracting Officer in the maintenance and operation of the Building Systems. A training day is defined as eight (8) hours of classroom instruction, including breaks and lunchtime, Monday through Friday, during the daytime shift in effect at the training facility. For guidance in planning the required instruction, the Contractor shall assume that the attendees will have a high school education or equivalent, and are familiar with the systems. No training will be scheduled until training manuals and O&M manuals have been approved by the Government.

b. The course shall be taught at the project site for a period of four (4) training days. The training courses shall cover all the material contained in the Operating and Maintenance Instructions, the layout and location of each system and shall include the following for each system: preventive maintenance, troubleshooting, diagnostics, calibration, adjustment, commissioning, and repair procedures. Typical systems and similar systems may be treated as a group, with instruction on the physical layout of one such system.

1.27 TECHNICAL SPECIFICATIONS

Government technical guide specifications (available as indicated in Section 01332, SUBMITTALS DURING DESIGN) shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product and installation requirements for the project. The provided specifications define the minimum requirements for items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals and testing that shall be provided for the project. Where items of equipment, materials, installation, training, operating and maintenance instruction, O&M manuals or testing requirements are not covered in the provided specifications, special sections within each guide specification shall be prepared to cover those subjects. Specific items of equipment identified in the provided specifications but not required for the project shall be edited out. Government approval is required for any specification addition or deletion. As a minimum the following specifications shall be provided:

- a. ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND - SECTION 16375a
- b. EXTERIOR LIGHTING - SECTION 16528a
- c. CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE) - SECTION 13110a
- d. LIGHTNING PROTECTION SYSTEM - SECTION 13100a
- e. ELECTRICAL WORK, INTERIOR - SECTION 16415a
- f. FIRE DETECTION AND ALARM SYSTEM, ADDRESSABLE - SECTION 13851a

- g. PREMISES DISTRIBUTION SYSTEM - SECTION 16710a
- h. TELEPHONE SYSTEM, OUTSIDE PLANT - SECTION 16711a

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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SECTION 01008

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SECTION 01008

FIRE PROTECTION REQUIREMENTS

PART 1 FIRE PROTECTION REQUIREMENTS

1.1 GENERAL PARAMETERS

Fire protection shall be based on sound fire protection engineering principles that gives safeguards against loss of life and property by fire, consistent with the mission, risk involved, and economical utilization. Fire protection criteria shall be based on the following code requirements:

- Uniform Building Code (1997 Edition)
- NFPA 101 (Life Safety Code, 2000 Edition)
- NFPA 72 (National Fire Alarm Code, 1999 Edition)
- NFPA 13 (Installation of Sprinkler Systems, 1999 Edition)
- Military Handbook 1008C (Mil.HdBk, 10 June 1997)

All applicable requirements of the aforementioned codes shall be incorporated into the design. Life Safety Code, NFPA 101 relative to this design shall give special attention to the application of fire codes as they relate to Life Safety. Features of fire protection based on the following shall be included in the design: automatic operating devices; exiting for inhabitants and the protection of egress components; personnel safety in hazardous areas; appropriate ratings of partitions, doors and windows; travel distances; common paths of travel; occupancy types; hazard of occupancies and their contents; isolation from the remainder of the facility; etc.

Applicable requirements of the Uniform Building Code shall also be included in the design. These shall include the following: Types of construction; Fire area limitations; increases to allowable floor areas; separation of structures.

All military construction must comply with the code requirements set/forth in Military Handbook 1008C.

1.1.1 Types of Occupancies and List of Hazardous Areas/Essential Equipment

1.1.1.1 Occupancy Classification

This project consists of one building. The building shall be an Assembly Occupancy in accordance with NFPA 101, Section 6-1.2. According to the Uniform Building Code (UBC), the building shall be classified as "Group A, Division 2.1" occupancy in accordance with Chapter 3, Table No. 3A.

1.1.1.2 Classification of Hazard of Contents

The classification of hazard of contents shall be determined by the portion of each building which has the greatest hazard.

1.1.2 Separation of Structures

1.1.2.1 Exposure Classification

The building construction is a two-story structure. The types of non-combustible roof construction options available for each facility shall be determined by the Proposer.

1.1.2.2 Separation Distance in Feet

UBC, Table 5-A requires a separation of 10 feet for a one-hour wall, unless the exterior wall has a two-hour rating.

1.1.3 Fire Fighting Support

The main fire fighting support shall be supplied by an automatic wet pipe sprinkler system. This fire protection and suppression system shall be tied into the building's fire detection and alarm system. The building shall be provided with fire extinguisher cabinets. These shall be located so that not more than 75 feet of travel distance between fire extinguisher cabinets shall be required at any point in the facility. The fire extinguisher cabinets shall be of the fully recessed type in all finished areas.

In addition a zoned fire alarm system shall be provided that covers the various parts of the building, monitoring of the sprinkler system, air handling units, etc..

See subsequent paragraphs of this Fire Protection section for additional information regarding fire suppression, detection, and other aspects of fire fighting support. Fire extinguishers are to be Contractor furnished/Contractor installed.

1.2 FUNCTIONAL AND TECHNICAL REQUIREMENTS

1.2.1 Construction for Fire Resistances of the Building Including Roofs, Walls, and Doors.

1.2.1.1 Building Construction Type

Each building shall comply with a minimum Type II-1hr in accordance with UBC, Table No. 6-A.

1.2.1.2 Exterior Walls

Exterior walls of the facilities shall be 1-hour rated as long as minimum distances from other buildings are maintained.

1.2.1.3 Roof

The building roof covering shall be Factory Mutual Approved or classified by Underwriter's Laboratory as Class A, roof system.

1.2.1.4 Interior Walls

One hour fire resistive walls shall be constructed around stair enclosures or separate janitor's closets, mechanical rooms, electrical rooms, and communications rooms per NFPA 101, from other parts of the buildings. All penetrations in fire rated walls (conduits, pipes, cable trays...etc.) shall be fireproofed according to their respective wall/floor/ceiling rating (sealed) at each penetration. See the Fire Protection plans for rated wall locations.

1.2.2 Type of Occupancies, Occupant Loads, Exits, and Travel Distances to Exits

1.2.2.1 Occupancies

The facility shall be considered an assembly occupancy in accordance with NFPA 101, Chapter 12.

1.2.2.2 Occupant Load

For purposes of determining required exits, the occupant load shall be based upon the maximum number of persons intended to occupy that space but not less than NFPA 101, Chapter 12.

1.2.2.3 Means of Egress

Not less than two exits shall be accessible from every part of the facility.

1.2.2.4 Travel Distance to Exits

Allowable travel distance limits to exits shall be per NFPA 101, Chapter 12.

1.2.2.5 Allowable Floor Area

Allowable floor area limitations shall be in accordance with UBC, Table 5-B and Section 504. Proposer shall determine construction type and apply the applicable portion of this code requirement. However, it is required that each building, be provided with a 100% sprinkler coverage automatic sprinkler coverage.

1.2.2.6 Maximum Building Height

Maximum height limitations are outlined in UBC, Table 5-B.

1.2.3 Fire Extinguisher Cabinets

Fire extinguisher cabinets shall be provided per NFPA 10 with a travel distance between fire extinguisher cabinets not to exceed 75 feet. Fire extinguisher cabinets shall be fully-recessed in finished areas, such as administrative, conference, corridors, etc.. Fire extinguishers shall be part of this contract.

1.2.4 Sprinkler Systems

Sprinkler systems shall be provided for 100% coverage and shall be a wet pipe sprinkler system. Systems design shall be in accordance with NFPA 13 and Military handbook 1008C. An area of demand of 3,000 square feet shall be used for the wet pipe sprinkler system. The hose stream demand shall be 500 gal/min.

1.2.5 Fire Department Connections and Fire Hydrants

Fire Department connections for the sprinkler system(s) shall be provided with suitable all weather access for pumper apparatus within 150 feet, reference Mil Handbook 1008C, Section 2.11.1. A minimum of one fire hydrant shall be located within 150 feet of the fire department connections, reference Mil Handbook 1008C, Section 5.7.3.2 (a).

1.2.6 Resistance to Interior Finishes and Materials to Flame Spread and Smoke Development

1.2.6.1 Interior Finishes

Interior finish materials on walls, ceilings, and partitions in all exits shall be Class A as defined in the Uniform building Code (UBC) and Mil. HdBk 1008C Section 2.7. All other areas shall have Class A or B interior finish materials for walls, ceilings, and furnishings. Smoke Developed Ratings shall not exceed 50 for Class A materials and 100 for Class B materials when tested in accordance with ASTM E-84.

1.2.6.2 Cellular Plastics

Cellular Plastics shall not be used as interior wall and ceiling materials per Mil HdBk. 1008C, Section 2.7.

1.2.6.3 Floor Finishes

Floor finishes shall be Class I or Class II. Carpet and other floor finishes shall have passed the acceptable criteria of American Society for Testing and Materials (ASTM) standard 84 or equivalent.

1.2.7 Fire Alarm and Detection System

The fire alarm and detection system shall be compatible with and tied into the existing BASE system. The entire facility shall have automatic fire detectors designed in accordance with NFPA 72 and NFPA 101. Manual pull stations shall be provided and located in accordance with NFPA 101. Supervisory initiating devices shall be provided and designed in accordance with NFPA 13 and 72. Placement of audio/visual devices shall comply with the Americans with Disabilities Act (ADA), paragraph 4.28 and NFPA 72, Chapter 6. Use the most stringent requirements from ADA or NFPA 72 where conflicts occur. Outside electric bell for sprinkler system(s) shall also be provided with a visual strobe. The facility shall be provided with a main control panel. A local annunciator at the Physical Fitness Center is required. Design shall be in accordance with Fire Detection and Alarm Specification, Addressable - SECTION 13851a. Fire alarm system shall be addressable to each device. Hybrid systems which have addressable loops are NOT acceptable. The main building fire alarm panel shall be located in the Vestibule adjacent to the main entrance door. All alarms/status conditions for each device shall report/sound/flash local to the facility and also report back to the BASE Fire Department. **Base system is King-Fisher and as such a King-Fisher Transmitter panel (KFAPT) shall be provided. Building alarm system shall be compatible to this system.** Contractor shall provide all programming required at the Physical Fitness Center and at the BASE Fire Department to accommodate the Physical Fitness Center fire detection and alarm system.

1.2.7.1 Panel Location

The Main Fire Alarm control panel shall be located in the Vestibule adjacent to the main entrance. A local annunciator at the Physical Fitness Center is required. Final location of the Main Fire Alarm control panel shall be coordinated with the BASE Fire Marshall.

1.2.7.2 Connection

1.2.7.3 NOT USED

1.2.7.4 NFPA 13 and NFPA 72 Requirements

Provide control modules, smoke detectors, heat detectors, OS&Y tamper switches and water flow switches as required by NFPA 13 and NFPA 72.

1.2.7.5 Other Requirements

Provide duct detectors, manual pull stations, flow switches, tamper switches, notifications appliances, etc.. The notification appliances shall be with flashing strobe.

1.2.7.6 Alarm Verification

The system shall be provided with alarm verification features. The alarm verification features shall reduce false alarms due to transient conditions. The alarm/activation delay shall be adjustable from 0 to 60 seconds.

1.2.7.7 Indicating Devices

Evacuation indicating signalling devices shall be provided and designed in accordance with NFPA 101. Evacuation alarms shall be activated by a smoke detector, a manual pull station, or a flow switch.

1.2.7.8 System Design

The fire detection system shall be designed IAW the above criteria, with the criteria specified in paragraph SYSTEM DESIGN of technical specification SECTION 13851, FIRE DETECTION AND ALARM SYSTEM, ADDRESSABLE, and with the criteria specified SECTION 01007 ELECTRICAL REQUIREMENTS.

1.3 DESIGN OBJECTIVES AND PROVISIONS

1.3.1 Zoning and Treatment of Each Potential Hazard

1.3.1.1 Walls

All areas where a potential hazard exists greater than that of the primary occupancy, shall be separated from the primary occupancy by walls having not less than 1-hour fire resistive construction.

1.3.1.2 Limiting Fire Spread

Every horizontal opening, and hazardous location as defined by NFPA 101 shall be protected.

1.3.1.3 Fire Alarms and Extinguishing Systems

The facilities shall be provided with a fire suppression system and a detection system as indicated previously.

1.3.2 Provision and Maintenance of an Unobstructed Emergency Egress System.

All corridor widths, clear space requirements relative to exit doors, etc., shall be in accordance with the Uniform Federal Accessibility Standards for unobstructed egress.

1.3.3 Dead Ends

* Maximum dead ends shall be as per NFPA 101 (LSC).

1.3.4 Egress Locations

Egress locations shall be marked with exit signs per Section 5-10 (LSC).

1.3.5 Outside Exit Doors

Doors for outside exit doors shall swing in the direction of exit travel. Outside exit doors shall be equipped with panic hardware mounted 44 inches above the finish floor and have a minimum clear width of 34 inches to allow for egress.

1.3.6 Required Fire Exits

Required fire exits from the building shall lead to a public way or to a clear safe area at a minimum distance of 75 feet from the building.

PART 2 NOT USED

PART 3 NOT USED

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SECTION 01040

AS-BUILT DRAWINGS
5/00 (Rev Oct 2001)

PART 1 GENERAL

1.1 DEFINITIONS

The definitions listed below form a part of this specification.

1.1.1 Construction Drawings

Final design drawings accepted by the Government for construction of the facility.

1.1.2 Red-Line Drawings

Construction drawings marked-up to show actual work performed to include necessary sketches, modification drawings, shop drawings and notes. Green ink is used to indicate work deleted from the contract. Red ink is used for additions and deviations from the contract.

1.1.3 As-Built Drawings

Professional finished mylar drawings and electronic CADD files developed from the Construction drawings that include all of the information from the redline drawings and suitable for half-size reproduction.

1.1.4 Vellum Drawings

Drawings on erasable Vellum 20# similar or equal to Xerox Zero solvent vellum.

1.1.5 Black-Line Drawings

Paper drawings reproduced from mylar drawings and suitable for microfilming.

1.1.6 Full-Size Drawings

28 inches x 40 inches nominal size drawings with all details visually readable.

1.1.7 Half-Size Drawings

14 inches x 20 inches nominal size drawings with all details visually readable.

1.1.8 Modification Circle

A circle with a horizontal line through the center. The top half will contain the letter "P" with the bottom half containing the Modification number. The lettering standard will be 120/6 WRICO or similar.

1.1.9 Mylar Drawings

Drawings on polyester film, 3 or 5 mil, similar or equal to K & E Stabilene.

1.1.10 Electronic CADD Files

Electronic CADD files are files saved on CD-ROM in accordance with appropriate CADD standard. The CADD standard will include level on/off status, special characters, line weights, font, and size requirements.

1.2 GENERAL REQUIREMENTS

The work includes creation of mylar and electronic cadd files on AutoCADD 2002 as-built drawings to accurately depict existing conditions of the project. As-Built Drawings will become the permanent record drawings of the construction. The Contractor is responsible for development of electronic CADD files in accordance with Omaha District CADD standards. Omaha District's CADD standards are located on the Omaha District's FTP site (<ftp://ftp.nwo.usace.army.mil/pub/ED/CADD/ae/standards/ACADstd.pdf>) for AutoCADD. The As-Built drawings shall include all major features of the work and all details to the same level as the construction set of drawings. All changes from the construction drawings, including but not limited to all deviations, additional information, and modifications to the contract. Where construction drawings or specifications allow for options, only the option selected and actually constructed shall be shown on the As-Built Drawings. Systems designed or enhanced by the Contractor such as HVAC control system, fire alarm system fire sprinkler system, irrigation sprinkler system, letters of clarification, shall be accurately and neatly recorded on the As-Built Drawings using the same symbols, terminology, and general quality as the construction set of drawings. All sheets affected by a change shall be revised. The transmittal requirements for the As-built Drawings shall be shown as events on the Contractor prepared progress chart or network analysis system (NAS), whichever is applicable.

1.3 PAYMENT

In accordance with the clause "Payment Under Fixed - Price Construction Contracts", which provides for progress payments on estimates of work accomplished (which meets the standards of quality established under the contract), \$(number of drawings in accepted design package x \$250 per sheet) will be withheld from payment for the creation of As-Built drawings until the final as-built drawings are delivered to the Contracting Officer (including any necessary revisions and subject to the approval of the Contracting Officer).

1.4 TRANSMITTAL OF AS-BUILT DRAWINGS

1.4.1 Preliminary As-Built Drawings

The Contractor shall produce Preliminary As-Built Drawings indicating as-built conditions on AutoCADD (Version 2002) with "clouding". Preliminary drawings shall consist of 15% of total project drawings. The As-Built CADD files which include all changes up to the time Preliminary Drawings shall be sent as stated below. The Contractor shall draw attention to all drawing changes by "clouding" the affected area. This "clouding" will be accomplished on layer 63 of the drawing file. The Preliminary Drawings shall consist of one (1) set of CADD files on a CD and one (1) full-size set of the Black-Line Drawings. One (1) set of CADD files on a CD shall be submitted to the Omaha District Office (ATTN: CENWO-ED-DI, Jim Janicek). One (1) full-size of the Black-Line Drawings

shall be submitted to the COR. Both documents shall be submitted three (3) weeks prior to the final acceptance inspection unless otherwise directed by the COR. The COR will notify the Contractor in writing of approval / disapproval. The Contractor shall not submit the Final Drawings until he receives the COR's letter approving the Preliminary Drawings.

1.4.2 Final As-Built Drawings

The Contractor shall produce Final As-Built Drawings on AutoCADD (Version 2002) without "clouding". The Final Drawings shall include all changes. The Final Drawings shall be submitted to the COR and Omaha District Office (CENWO-ED-DI) no earlier than the day of acceptance of the project and no later than thirty (30) days after the date on the acceptance letter for the Preliminary Drawing unless otherwise directed by the COR. (Note: Final drawings should not be forwarded to the customer. Corps of Engineers, Omaha District COR will forward to the customer after Quality Review.) One (1) set of CADD files on a CD shall be submitted to the Omaha District Office (ATTN: CENWO-ED-DI, Jim Janicek). Send the following documents to the COR: One (1) set of CADD files on CD (folder name containing as-built files shall be designated "AS-BUILTS" on each CD-ROM). Both CD case and CD shall contain the name of the project, location, specification number, and contract number, and words "As-Built Record Set"). The folder shall contain drawings, indexes and X-REF files related to all as-builts. In addition one full-size set of vellum As-Built Drawings, along with all red-lined hard copy drawings prepared by the Contractor during construction.

1.5 PROCEDURE

The Contractor shall create a set of electronic Cadd files and full-size Red-Line Drawings to fully indicate As-Built conditions. The Red-Line Drawings shall be maintained at the site, in a current condition until the completion of the work and shall be available for review by the COR at all times. All as-built conditions shall be on the Red-Line Drawings within two (2) days after the work activity is completed or shall be entered on the deficiency tracking system (see Section 01451A, CONTRACTOR QUALITY CONTROL).

1.6 TITLE BLOCKS

The contract number and the specification number (if available) shall be shown on all sheets. "RECORD DRAWING" shall be added below the title block on all sheets. All modifications to the contract shall be posted in ascending order. The top line of the revision box shall state "REVISED TO SHOW AS-BUILT CONDITIONS" and dated. All modifications to all plans, sections, or details, shall have a modification number placed in the revision box under column entitled "Symbol". The statement "GENERAL REVISIONS" may be used when applicable. The date to be added in the revision box for modifications is found in Block 3 of Form SF-30.

1.7 PROCEDURES FOR POSTING MODIFICATION CHANGES TO DRAWINGS

Follow directions in the modification for posting descriptive changes.

A Modification Circle shall be placed at the location of each deletion.

The highest modification number on the sheet should be shown in the modification circle in the "DATE" and "DRAWING CODE" boxes of the title block.

For all new details or sections that are added to a drawing, place

a Modification Circle by the detail or section title.

For changes to a drawing, place a Modification Circle by the title of the affected plan, section or detail titles (each location).

For changes to schedules on drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.

The Modification Circle size shall be 1/2-inch diameter unless the area where circle is to be placed is crowded. Use smaller size circle for crowded areas.

1.8 WORD ABBREVIATIONS

Abbreviations shown on the abbreviation sheet shall be used to describe all work items. Additional word abbreviations, not found on the abbreviation sheet but necessary to describe the work, shall be properly identified and incorporated with the other standard word abbreviations.

1.9 LEGEND SHEETS

Symbols, which conflict with those on the original construction drawings legend sheet, shall not be used. Additional symbols, properly identified, necessary to depict any additional work items, shall be added to the legend sheet or supplemental legend. Those projects that do not have legend sheets may use supplemental legends on each sheet where symbol is shown.

1.10 CONTRACTOR SHOP DRAWINGS

Contractor shop drawings, which supersede data on the construction plans and/or additional drawings, prepared by the Contractor, shall be incorporated into the As-Built Drawings. Design plans prepared by Contractor shall include the designer's name on the As-Built Drawings.

1.11 INDEXING OF DRAWINGS

If drawings are added to the portfolio of drawings to depict as-built conditions, the index of drawings shall be revised accordingly.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL

As-Built drawings shall include as-built information to the same level of detail as shown on the original details, unless otherwise specified. The Contractor shall provide any additional full-size drawings as required to display all the details.

3.2 SITE WORK

3.2.1 Utilities

All utilities shall be shown whether active, inactive, shown on the construction drawings, or found on-site. The type of utility, location, general direction, size, material make-up and depth shall be shown. The location and description of any utility line or other installations of any kind known to exist within the construction area shall be shown. The

location shall include dimensions to permanent features.

3.2.2 Structures

Structures above and below ground shall be shown. The size, material make-up, location, height, and/or depth shall be shown. Manholes shall show rim elevation and invert elevations as applicable. Power poles shall show electrical equipment and voltage rating.

3.2.3 Grades

Grade or alignment of roads, structures, or utilities shall be corrected if any changes were made from the construction drawings. Elevations shall be corrected if changes were made in site grading.

3.3 STRUCTURAL

3.3.1 Steel

Shop drawings that deviate from the construction drawings shall be incorporated in the As-Built Drawings.

3.4 MECHANICAL

3.4.1 Ductwork

Ductwork shall be shown to reflect actual installation and duct size. Ductwork routing changes shall be shown.

3.4.2 Plumbing

Piping and fixtures shall be shown to reflect the type of material, size and the route or location.

3.5 ELECTRICAL

3.5.1 PANELS

All construction drawing panel schedules shall be revised to show as-built conditions. Home-run circuit designation on electrical drawings shall accurately correspond to the as-built panel schedules.

3.5.2 Controls

All control diagrams on the construction drawings shall be revised to reflect as-built conditions, and setpoints.

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SECTION 01200

WARRANTY OF CONSTRUCTION

5/00 (Rev 10/00)

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SECTION 01200

WARRANTY OF CONSTRUCTION
5/00 (Rev 10/00)

PART 1 GENERAL

1.1 WARRANTY OF CONSTRUCTION

(a) Foremost and in addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

(b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of--

(1) The Contractor's failure to conform to contract requirements;
or

(2) Any defect of equipment, material, workmanship, or design furnished by the Contractor.

(d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause.

(e) The Contractor's warranty with respect to work restored, repaired or replaced will run for 1 year from the date of restoration, repair or replacement. This provision applies equally to all items restored, repaired, or replaced under paragraph (c) and (d) above.

(f) The Government will notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage. Repair work necessary to correct a warranty condition which arises to threaten the health or safety of personnel, the physical safety of property or equipment, or which impairs operations, habitability of living spaces, etc., will be performed by the Contractor on an immediate basis as directed verbally by the Government. Written verification will follow verbal instruction.

(g) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of verbal or written notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(h) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall--

(1) Obtain all warranties that would be given in normal commercial practice;

(2) Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and

(3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(i) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(j) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

(k) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

1.2 ADDITIONAL WARRANTY REQUIREMENTS

1.2.1 Performance Bond

(a) It is understood that the Contractor's Performance Bond will remain effective for one (1) year from the date of acceptance.

(b) If either the Contractor or his representative doesn't diligently pursue warranty work to completion, the contractor and surety will be liable for all costs. The Government, at its option, will either have the work performed by others or require the surety to have it done. Both direct and administrative costs will be reimbursable to the Government.

1.2.2 Pre-Warranty Conference

(a) Prior to contract completion and at a time designated by the Contracting Officer or his authorized representative, the Contractor shall meet with the Contracting Officer or his authorized representative to develop a mutual understanding with respect to the requirements of the Paragraph: WARRANTY OF CONSTRUCTION. Communication procedures for Contractor notification of warranty defects, priorities with respect to the type of defect and other details deemed necessary by the Contracting Officer or his authorized representative for the execution of the construction warranty shall be established/reviewed at this meeting.

(b) In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor will furnish the name, telephone number and address of the service

representative which is authorized to initiate and pursue warranty work action on behalf of the Contractor and surety. This single point of contact will be located within the local service area of the warranted construction, will be continuously available, and will be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any Contractual responsibilities in connection with the paragraph: WARRANTY OF CONSTRUCTION.

(c) Local service area is defined as the area in which the contractor or his representative can meet the response times as described in paragraph 1.2.4 and in any event shall not exceed 200 miles radius of the construction site.

1.2.3 Equipment Warranty Identification

The Contractor shall provide warranty identification tags on all mechanical and electrical equipment installed under this contract. Tags and installation shall be in accordance with the requirements of Paragraph: EQUIPMENT WARRANTY IDENTIFICATION TAGS.

1.2.4 Warranty Service Calls

The Contractor or his local service representative will respond to the site, to a call within the time periods as follows: Four (4) hours for Heating, Air Conditioning, Refrigeration, Air Supply and Distribution, Critical Electrical service Systems and Food Service Equipment and Twenty-Four (24) hours For All Other Systems.

1.2.5 Equipment Warranty Booklet

At or before 30 days prior to final inspection and acceptance of the work, the Contractor shall submit the data mentioned as follows:

The Contractor shall provided a Booklet, which consists of a listing of all equipment items (see paragraphs a. and b. below) which are specified to be guaranteed along with the warranty papers for each piece of equipment. Three (3) legible bound copies of the booklet shall be submitted for approval and shall be indexed alphabetically by equipment type. For each specific guaranteed item, the name, address, and telephone number shall be shown on the list for the subcontractor who installed equipment, equipment supplier or distributor, and equipment manufacturer. Completion date of the guarantee period shall correspond to the applicable specification requirements for each guaranteed item. The names of service representatives that will make warranty calls along with the day, night, weekend and holiday contacts for response to a call within the time period specified shall also be identified.

a. For Equipment in Place: The equipment list shall show unit retail value and nameplate data including model number, size, manufacturer, etc. This would include capital equipment and other nonexpendable supplies of a movable nature that are not affixed as an integral part of the facility and may be removed without destroying or reducing the usefulness of the facility. Some examples are spare parts, special tools, manufacturing equipment, maintenance equipment, instruments, installed under this contract.

b. For Installed Building Equipment: The equipment list shall show unit retail value and nameplate data including model number, size, manufacturer,

etc. This would include items of equipment and furnishings (including material for installation thereof), which are required to make the facility usable and are affixed as a permanent part of the structure. Some examples are plumbing fixtures, laboratory counters and cabinets, kitchen equipment, mechanical equipment, electrical equipment, and fire protection systems installed under this contract.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals

Equipment Warranty Booklet

1.4 EQUIPMENT WARRANTY IDENTIFICATIONS TAGS

1.4.1 GENERAL REQUIREMENTS

The Contractor shall provide warranty identification tags on all Contractor and government furnished equipment which is Contractor installed.

1.4.1.1 Tags and Information

The tags and information shall be similar in format and size to the exhibits provided by this specification, and shall be suitable for interior and exterior locations, resistant to solvents, abrasion, and to fading caused by sunlight, precipitation, etc. These tags shall have a permanent pressure- sensitive adhesive back, and shall be installed in a position that is easily (or most easily) noticeable. If the equipment surface is not suitable for adhesive back, Contractor shall submit his alternative to the Contracting Officer's Authorized Representative for review and approval. Contractor furnished equipment that has differing warranties on its components will have each component tagged.

1.4.1.2 Tags for Warranted Equipment

The tag for his equipment shall be similar to the following:

EQUIPMENT WARRANTY	
CONTRACTOR FURNISHED EQUIPMENT	
MFG-----	MODEL NO.-----
SERIAL NO.-----	
CONTRACT NO.-----	
CONTRACTOR NAME-----	
CONTRACTOR ADDRESS-----	

CONTRACTOR TELEPHONE-----
CONTRACTOR WARRANTY EXPIRES-----
IN CASE OF WARRANTY ACTION FIRST CONTACT
[DEH] [BCE] AT [TELEPHONE NUMBER]

EQUIPMENT WARRANTY	
GOVERNMENT FURNISHED EQUIPMENT	
MFG _____	MODEL NO. _____
SERIAL NO. _____	
CONTRACT NO. _____	
DATE EQUIP PLACED IN SERVICE _____	

1.4.1.3 Exclusion to Providing Tags

If the manufacturer's name (MFG), model number and serial number are on the manufacturer's equipment data plate and this data plate is easily found and fully legible, this information need not be duplicated on the equipment warranty tag. The Contractor's warranty expiration date and the final manufacturer's warranty expiration date will be determined as specified by the Paragraph "WARRANTY OF CONSTRUCTION".

1.4.2 EXECUTION

The Contractor will complete the required information on each tag and install these tags on the equipment by the time of and as a condition of final acceptance of the equipment. The Contractor shall be responsible for scheduling acceptance inspection with the Contracting Officer (verbal and written notification required). If this inspection is delayed by the Contractor, the Contractor shall, at his own expense, update the in-service and warranty expiration dates on these tags.

1.4.3 Equipment Warranty Tag Replacement

Under the terms of this contract, the Contractor's warranty with respect to work repaired or replaced shall run for one year from the date of repair or replacement. Such activity shall include a data warranty identification tag on the repaired or replaced equipment. The tag shall be furnished and installed by the Contractor, and shall be similar to the original tag, except that it should include the scope of repair and that the contractor's warranty expiration date will be one year from the date of acceptance of the repair or replacement. In the case of repair, the repair only will be covered by the extended warranty. In the case of replacement of a component, the component only will be covered by the extended warranty. In these cases, the original tags will not be removed, but an additional tag

will be installed for the repair or component replacement.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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SECTION 01320A

PROJECT SCHEDULE
08/01; Omaha Rev. 10/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of the specification to the extent referenced. The publications are referenced in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11 (1995) Progress, Schedules, and Network
Analysis Systems

1.2 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS, a Project Schedule as described below shall be prepared. The scheduling of construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments. The scheduler shall be a direct employee of the prime contractor and have a minimum of 2 years experience in scheduling.

3.2 BASIS FOR PAYMENT

The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule or scheduling personnel will result in an inability of the Contracting Officer to evaluate Contractor's progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer and those revisions have not been included in the Project Schedule, the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer.

3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in the Precedence Diagram Method (PDM).

3.3.2 Level of Detail Required

The Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the Contracting Officer at the appropriate level of detail, as specified by the Contracting Officer, shall result in the disapproval of the schedule. The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule:

3.3.2.1 Activity Durations

Contractor submissions shall follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods (usually less than 2 percent of all non-procurement activities' Original Durations are greater than 20 days).

3.3.2.2 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, and delivery.

3.3.2.3 Critical Activities

The following activities shall be listed as separate line activities on the Contractor's project schedule:

- a. Submission and approval of mechanical/electrical layout drawings.
- b. Submission and approval of O & M manuals.
- c. Submission and approval of as-built drawings.
- d. Submission and approval of 1354 data and installed equipment lists.
- e. Submission and approval of testing and air balance (TAB).
- f. Submission of TAB specialist design review report.

- g. Submission and approval of fire protection specialist.
- h. Submission and approval of testing and balancing of HVAC plus commissioning plans and data.
- i. Air and water balance dates.
- j. HVAC commissioning dates.
- k. Controls testing plan.
- l. Controls testing.
- m. Performance Verification testing.
- n. Other systems testing, if required.
- o. Prefinal inspection.
- p. Correction of punchlist from prefinal inspection.
- q. Final inspection.

3.3.2.4 Government Activities

Government and other agency activities that could impact progress shall be shown. These activities include, but are not limited to: approvals, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.

3.3.2.5 Responsibility

All activities shall be identified in the project schedule by the party responsible to perform the work. Responsibility includes, but is not limited to, the subcontracting firm, contractor work force, or government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.

3.3.2.6 Work Areas

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.

3.3.2.7 Modification or Claim Number

Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number. Whenever possible, changes shall be added to the schedule by adding new activities. Existing activities shall not normally be changed to reflect modifications.

3.3.2.8 Bid Item

All activities shall be identified in the project schedule by the Bid Item

to which the activity belongs. An activity shall not contain work in more than one bid item. The bid item for each appropriate activity shall be identified by the Bid Item Code.

3.3.2.9 Phase of Work

All activities shall be identified in the project schedule by the phases of work in which the activity occurs. Activities shall not contain work in more than one phase of work. The project phase of each activity shall be by the unique Phase of Work Code.

3.3.2.10 Category of Work

All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited, to the procurement chain of activities including such items as submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing. The category of work for each activity shall be identified by the Category of Work Code.

3.3.2.11 Feature of Work

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to, a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.

3.3.3 Scheduled Project Completion

The schedule interval shall extend from NTP to the contract completion date.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date on which the NTP was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have an "ES" constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.3.2 Constraint of Last Activity

Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.3.3 Early Project Completion

In the event the project schedule shows completion of the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted in the narrative report at every project schedule update period to assist the Contracting Officer in evaluating the Contractor's ability to actually

complete prior to the contract period.

3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.4.1 Start Phase

The Contractor shall include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the NTP was acknowledged, and a zero day duration.

3.3.4.2 End Phase

The Contractor shall include as the last activity in a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.4.3 Phase X

The Contractor shall include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in-progress or completed activity, and failure to ensure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Program features which calculate one of these parameters from the other shall be disabled.

3.3.6 Out-of-Sequence Progress

Activities that have posted progress without all preceding logic being satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case approval of the Contracting Officer. The Contractor shall propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule.

3.3.7 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Preliminary Project Schedule Submission

The Preliminary Project Schedule, defining the Contractor's planned operations for the first 60 calendar days shall be submitted for approval within 20 calendar days after the NTP is acknowledged. The approved preliminary schedule shall be used for payment purposes not to exceed 60 calendar days after NTP.

3.4.2 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within 40 calendar days after NTP. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail.

3.4.3 Monthly Schedule Updates

Based on the result of progress meetings, specified in "Monthly Progress Meetings," the Contractor shall submit monthly schedule updates. These submissions shall enable the Contracting Officer to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgement of the Contracting Officer or authorized representative is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.4.4 Standard Activity Coding Dictionary

The Contractor shall use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11, Appendix A. This exact structure is mandatory, even if some fields are not used.

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted by the Contractor for the preliminary submission, initial submission, and every monthly project schedule update throughout the life of the project:

3.5.1 Data Disks

Two data disks containing the project schedule shall be provided. Data on the disks shall adhere to the SDEF format specified in ER 1-1-11, Appendix A.

3.5.1.1 File Medium

Required data shall be submitted on 3.5 disks, formatted to hold 1.44 MB of data, compatible with Microsoft Windows 95/98 operating systems, unless otherwise approved by the Contracting Officer.

3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The

label shall indicate the type of schedule (Preliminary, Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number or person responsible for the schedule.

3.5.1.3 File Name

Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will ensure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.2 Narrative Report

A Narrative Report shall be provided with the preliminary, initial, and each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the 2 most critical paths, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to relay to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis.

3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the Contracting Officer shall be included in the schedule submission. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in progress or completed.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number.

3.5.4.2 Logic Report

A list of Preceding and Succeeding activities for every activity in ascending order by activity number. Preceding and succeeding activities shall include all information listed above in paragraph Schedule Reports. A blank line shall be left between each activity grouping.

3.5.4.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates. Completed activities shall not be shown on this report.

3.5.4.4 Earnings Report

A compilation of the Contractor's Total Earnings on the project from the NTP until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and Contracting Officer at the most recent Monthly Progress Meeting. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by bid item and sorted by activity numbers. This report shall: sum all activities in a bid item and provide a bid item percent; and complete and sum all bid items to provide a total project percent complete. The printed report shall contain, for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), and Earnings to Date.

3.5.5 Network Diagram

The network diagram shall be required on the initial schedule submission and on monthly schedule update submissions. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity number, description, duration, and estimated earned value shall be shown on the diagram.

3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

The critical path shall be clearly shown.

3.5.5.4 Banding

Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly onsite meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer will approve activity progress, proposed revisions,

and adjustments as appropriate.

3.6.1 Meeting Attendance

The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost-to-Date shall be subject to the approval of the Contracting Officer. As a minimum, the Contractor shall address the following items on an activity by activity basis during each progress meeting.

3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish dates for each activity currently in-progress or completed .

3.6.3.2 Time Completion

The estimated Remaining Duration for each activity in-progress. Time-based progress calculations shall be based on Remaining Duration for each activity.

3.6.3.3 Cost Completion

The earnings for each activity started. Payment will be based on earnings for each in-progress or completed activity. Payment for individual activities will not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

3.6.3.4 Logic Changes

All logic changes pertaining to NTP on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.3.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather. 2) delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary. 3) Changes required to correct a schedule which does not represent the actual or planned prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, or any interim milestone date, the Contractor shall furnish the following for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract: justification, project schedule data, and supporting evidence as the Contracting Officer may deem necessary. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

3.7.1 Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request.

The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, will not be a cause for a time extension to the contract completion date.

3.7.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date of under 2 weeks based upon the most recent schedule update at the time of the NTP or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

- a. A list of affected activities, with their associated project schedule activity number.
- b. A brief explanation of the causes of the change.
- c. An analysis of the overall impact of the changes proposed.
- d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

For any requested time extension of over 2 weeks, the Contracting Officer may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If the NTP is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The proposed revisions to the schedule will be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions

furnished by the Contracting Officer, the Contractor shall advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

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SECTION 01330

SUBMITTAL PROCEDURES
09/01; Omaha Update 10/01

PART 1 GENERAL

Attachments: Submittal Register
ENG Form 4025, Transmittal Form

1.1 SUMMARY

This section includes administrative and procedural requirements for construction submittals presented by the Contractor after 100% corrected plans and specifications have been accepted by the government. This section also includes requirements for developing, submitting and maintaining a "Submittal Register".

1.2 CONTRACTOR RESPONSIBILITIES

The Contractor is responsible for total management of his work including approval, scheduling, control, and certification of all submittals. The submittal management system provided in these specifications is intended to be a complete system for the Contractor to use to control the quality of materials, equipment and workmanship provided by manufacturers, fabricators, suppliers and subcontractors. The Contractor shall review each submittal for contract compliance. The Submittal Register (ENG Form 4288) will be utilized to log and monitor all submittal activities. No construction or installation activities shall be performed prior to required approvals of applicable submittals. The Contractor shall perform a check to assure that all materials and/or equipment have been tested, submitted and approved during the preparatory phase of quality control inspections. The Contractor shall coordinate all submittals with the Contractor's Designer (A-E). Approval by the Contractor's Designer means that the submittal is in compliance with the Construction Set design submittal.

1.3 SUBMITTAL IDENTIFICATION (SD)

Submittals required are identified by SD numbers and titles as follows:

SD-01 Preconstruction Submittals

Tabular lists showing location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.

In addition, the following items are included:

Construction Progress Schedule
Health and safety plan
Work plan

Quality control plan
Environmental protection plan
Permits

SD-02 Shop Drawings

Submittals which graphically show relationship of various components of the work, schematic diagrams of systems, details of fabrication, layouts of particular elements, connections, and other relational aspects of the work.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Samples, including both fabricated and unfabricated physical examples of materials, products, and units of work as complete units or as portions of units of work.

Physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

Calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports

Daily checklists

Final acceptance test and operational test procedure

SD-07 Certificates

A document, required of the Contractor, or through the Contractor, from a supplier, installer, manufacturer, or other lower tier Contractor, the purpose of which is to confirm the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verifications of quality.

Statement signed by an official authorized to certify on behalf of the manufacturer of a product, system or material, attesting that the product, system or material meets specified requirements. The statement must be dated after the award of the contract, must state the Contractor's name and address, must name the project and location, and must list the specific requirements which are being certified.

Confined space entry permits.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and material safety data sheets, if any, concerning impedances, hazards, and safety precautions.

SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

Factory test reports.

SD-10 Operation and Maintenance Data

Data intended to be incorporated in operations and maintenance manuals.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

In addition, the following items are included:

As-built drawings

Special warranties

Posted operating instructions

Training plan

1.4 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.4.1 Designer Approved ("G-AE")

Designer approval is required for extensions of design, critical materials, deviations, any deviations from the solicitation, the accepted proposal, or the completed design, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings." All submittals noted in the technical specifications and Submittal Register as "G-AE" are subject to approval by the Contractor's Designer, prior to submittal to the Government. The Contracting Officer has the option to review any submittal. The Government will review all "G-AE" submittals for conformance to the solicitation and all submittals designated as variations from the Solicitation or 100% corrected design or as directed by the Contracting Officer.

1.4.2 Government Approved Construction Submittals ("G-RE")

"G-RE" submittals subject to Government approval are those so designated by the Contracting Officer during the design process or preconstruction meeting. All "G-RE" submittals shall be reviewed and approved by the Contractor's Quality Control Representative and the Contractor's Designer prior to submittal to the Government. Within the terms of the Contract Clause entitled "Specification and Drawings for Construction," they are considered to be "shop drawings." Any variance must clearly identify the variance as specified in paragraph: "Variations", below.

1.4.3 Government Reviewed Submittals

Government review is required for designated "G-RE" submittals and variations from the the solicitation requirements and completed design. Review will be only for conformance with the contract requirements. This also includes those construction submittals for which the design documents did not include enough detail to ascertain contract compliance. Government review will not include development of design calculations or other means of determining adequacy of design. The Contractor and his designer retains the sole responsibility for adequacy of design.

1.4.4 Information Only (FIO)

All submittals not requiring Contractor's Designer or Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above. The Contracting Officer has the option to review any submittal.

1.5 GOVERNMENT REVIEWED SUBMITTALS

The Contracting Officer's review of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information appear to meet the Solicitation requirements. Government Review will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Design and CQC requirements of this contract is responsible for design, compliance with design criteria required in the solicitation, dimensions, all design extensions, such as the design of adequate connections and details, etc. and the satisfactory construction of all work. After submittals have been reviewed for conformance or approval, as applicable, by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless

accompanied by an explanation of why a substitution is necessary.

1.6 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer, obtain the Contractor's Designer approval and Government approval, when applicable, and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. Any submittal found to contain errors or unapproved variations from the solicitation or accepted proposal, shall be resubmitted as one requiring "approval" action, requiring both Designer's approval and Government conformance review or approval, as applicable. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Contracting Officer.

1.7 WITHHOLDING OF PAYMENT

No Payment for materials incorporated in the work will be made if all required Designer or Contractor Quality Control Representative approvals or required Government conformance reviews or approvals, as applicable, have not been obtained. No payment will be made for any materials incorporated in the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.8 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. The Contractor's Quality Control (CQC) representative, and the Designer, as applicable, shall check, approve and stamp, sign, and date each item, indicating action taken. Proposed variations from the solicitation (contract requirements) or accepted 100% corrected design shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring conformance review or approval by the Government shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.9 SUBMITTAL REGISTER AND ENG FORM 4288 (RMS) SUBMITTAL REGISTER

The Contractor's Designer(s) shall develop a complete list of submittals during design. The Designer shall identify required submittals in the specifications. The list is to be used in preparing Submittal Register as approved by the Contracting Officer Representative. The example Submittal Register furnished with the Solicitation was created using Specsintact Software. The Contractor shall replace this example Submittal Register with the actual submittal register for the completed design specifications. The list is not all inclusive and additional submittals may be required. The attached and Contractor generated submittal register identifies only the submittal section, type of submittal, description of item submitted, paragraph number related to submittal item (section submittal paragraph if none listed), submittal classification (G), and submittal reviewer identifier (AE or RE). Any submittal without a submittal classification and submittal reviewer identifier is considered to be For Information Only (FIO). The submittal register generated by the Government Resident Management System (RMS) Software is used for tracking construction submittals and is referred to as ENG Form 4288 (RMS). Much of the same information contained on the Contractor generated submittal register will be included on the ENG Forms 4288 (RMS). The Contractor shall maintain a ENG Form 4288 (RMS) for the project in accordance with the attached ENG Form 4288 (RMS) Instructions. The Contractor will be furnished one (1) set of ENG Forms 4288 (RMS) at the preconstruction conference on which will be listed each item of equipment and material of each type for which fabricators' drawings, and/or related descriptive data, test reports, samples, spare parts lists, O&M manuals, or other types of submittals are required by the completed project specifications. The Contractor shall complete the appropriate columns as indicated on the attached ENG Form 4288 (RMS) Instructions and return six (6) completed copies to the Contracting Officer for acceptance within 20 calendar days after the preconstruction conference. Upon acceptance of the ENG Form 4288 (RMS) by the Contracting Officer, the ENG Form 4288 (RMS) will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period. The ENG Form 4288 (RMS) ACTIVITY NO. is filled in when a network analysis system is a contract requirement. The TRANSMITTAL NO. and ITEM NO. shall be left blank and used later to record the respective transmittal and item number corresponding to those listed on the transmittal form entitled: "TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE" (ENG Form 4025). The approved ENG Form 4288 (RMS) will become the scheduling document and will be used to control submittals throughout the life of the contract. The submittal register and the progress schedules shall be coordinated. Updates to the submittal register showing the Contractor action codes and actual dates shall be submitted monthly or until all submittals have been satisfactorily completed. When the progress schedule is revised, the ENG Form 4288 (RMS) shall also be revised and both submitted for approval.

1.10 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 20 calendar days exclusive of mailing time) shall be allowed and shown on the register for conformance reviews by the Contracting Officer for submittals requiring Government approval and for submittals which vary from the solicitation or accepted 100% corrected design. No delay damages or time extensions will be allowed for time lost in late submittals.

1.11 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting all submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

1.12 SUBMITTAL PROCEDURES

Submittals shall be made as follows:

1.12.1 Procedures

1.12.1.1 "G-AE" Submittals

All "G-AE" submittals shall be reviewed and approved by the Contractor's Quality Control Representative and Contractor's Designer prior to submittal to the Government. A conformance review is required by the Government on all "G-AE" submittals, prior to construction of the related items.

Except as noted below, data for all items listed as "G-AE" Submittals in the various sections shall be submitted in five (copies), except for the additional copies specified below. All five copies shall be submitted to the Area Engineer using the transmittal form. Items not to be submitted in multiples, such as samples and test cylinders, shall be submitted to the Area or Resident Engineer (as directed), accompanied by five (5) copies of the transmittal form. An additional copy of each "G-AE" submittals shall be submitted to: Omaha District (CENWO-ED-DI)- one (1) copy and Construction Division (CENWO-CD-QT)- one (1) copy, using the transmittal form.

Each required submittal, which is in the form of a drawing, shall be submitted as five (5) prints of the drawing. Drawing prints shall be either blue or black line permanent-type prints on a white background or blueprint and shall be sufficiently clear and suitable for making legible copies.

Catalog cuts and other descriptive data which have more than one model, size, or type or which shows optional equipment shall be clearly marked to show the model, size, or type and all optional equipment which is provided.

Submittals on component items forming a system or that are interrelated shall be submitted at one time as a single submittal in order to demonstrate that the items have been properly coordinated and will function as a unit.

An additional copy of reviewed and approved submittals related to fire protection/detection systems shall be submitted to the Base Civil Engineering Office. The mailing address for these submittals shall be obtained at the preconstruction conference.

1.12.1.2 "G-RE" and FIO Submittals

Except as noted below, data for all items listed as "G-RE" Submittals in the various sections shall be submitted in five (5) copies. All five copies shall be submitted to the Area Engineer for review and approval using the transmittal form. Items not to be submitted in multiples, such as samples and test cylinders, shall be submitted to the Area or Resident Engineer (as directed) accompanied by five (5) copies of the transmittal form.

All "G-RE" and "FIO" submittals shall be reviewed and approved by the Contractor's Quality Control Representative and Contractor's Designer (as applicable) prior to submittal to the Government. Government Approval is required on all "G-RE" submittals, prior to construction of the related items.

The Government has the option to review any For Information Only submittals.

1.12.1.3 Certificates of Compliance

Each certificate shall be signed by an official authorized to certify in behalf of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet the specific requirements.

1.12.1.4 Purchase Orders

Copies of purchase orders shall be furnished to the Contracting Officer when the Contractor requests assistance for expediting deliveries of equipment or materials, or when requested by the Contracting Officer for the purpose of quality assurance review. Each purchase order issued by the Contractor or his subcontractors for materials and equipment to be incorporated into the project shall (1) be clearly identified with the applicable DA contract number, (2) carry an identifying number, (3) be in sufficient detail to identify the material being purchased, (4) indicate a definite delivery date, and (5) display the DMS priority rating, if applicable.

1.12.1.5 Operation and Maintenance Instructions and/or Manuals

Where required by various technical sections, operations and maintenance instructions and/or manuals with parts lists included shall be provided by the Contractor in quintuplicate, unless otherwise specified, and shall be assembled in three-ring binders with index and tabbed section divider and having a cover indicating the contents by equipment or system name and project title and shall be submitted to the Area Engineer for approval (after approval by the Contractor's Quality Control Representative), 90 days prior to final tests of mechanical and electrical systems, unless otherwise specified. Each operation and maintenance manual shall contain a copy of all warranties. If field testing requires these copies to be revised, they shall be updated and resubmitted for approval within 10 calendar days after completion of tests. The Operations and Maintenance Instructions and/or Manuals shall be shown as a separate activity on the Contractor prepared construction schedule bar chart or network analysis system.

1.12.1.6 Interior/Exterior Finish Sample and Data

All submittals for interior finish samples and data shall be submitted concurrently and all submittals for exterior finish samples and data shall be submitted concurrently.

1.12.2 Variations

Variations from the solicitation (contract requirements) or the accepted 100% corrected design must be approved by the Contractor's Designer, Contractor's Quality Control Representative and Contracting Officer. For submittals which include proposed variations, the column "variation" of ENG Form 4025 shall be checked and a serial letter shall be simultaneously prepared and sent to the Area Engineer referencing this variation. The Contractor shall set forth in writing the reason for any variations and clearly annotate such variations on the submittal. The narrative shall include documentation of the nature and features of the variation and why the variation is desirable and beneficial to the Government. When submitting a variation for acceptance, the Contractor warrants that the contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of the work. The Contractor shall take actions and bear the additional costs, including review costs by the Government, necessary due to the proposed variation. In addition to the submittal review period specified above, allow ten (10) additional working days for consideration by the Government of submittals with variations. The Government reserves the right to rescind inadvertent acceptance of submittals containing unnoted variations.

1.13 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.14 SUBMITTALS (FINAL COPY)

Upon completion of review of submittals requiring Government conformance review or approval, the submittals will be identified as having received satisfactory review by being so stamped and dated.

1.14.1 "G-AE" Submittals

The Contracting Officer has the option to review any submittal. Two (2) copies of "G-AE" submittals, for conformance review by the Government, will be returned to the Contractor, except for samples, test cylinders, and O&M manuals for which two (2) copies of the transmittal form only will be returned to the Contractor. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. All "G-AE" submittals shall be reviewed and approved by the Contractor's Designer and Contractor's Quality Control Representative prior to submittal to the Government.

1.14.2 "G-RE" Submittals

Two (2) copies of "G-RE" submittals for approval will be returned to the Contractor except for samples, test cylinders, and O&M manuals for which two (2) copies of the transmittal form only will be returned to the Contractor.

1.15 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

1.16 STAMPS

Stamps used by the Contractor's Designer and the Contractor's designated Quality Control person on the submittal data to certify that the submittal meets contract requirements shall be similar to the following (use two stamps for submittals reviewed by both):

CONTRACTOR	
(Firm Name)	
_____	Approved
_____ Approved with corrections as noted on submittal data and/or attached sheets(s).	
SIGNATURE:	_____
TITLE:	_____
DATE:	_____

INSTRUCTIONS
ENG FORM 4288 (RMS)

1. The Contractor shall utilize the ENG Form 4288 (RMS) generated by the Government Residential Management System (RMS) software for tracking construction submittals. The Submittal Register information, columns (c) thru (f) from the Contractor generated Submittal Register, will be utilized by the Government to generate the ENG Form 4288 (RMS). The Government will furnish the Contractor a hard copy of the ENG Form 4288 (RMS) at the preconstruction conference. The ENG Form 4288 (RMS) includes the following items and parties responsible for completing the information required on the ENG Form 4288 (RMS):

a. Activity Number: will be provided by the Contractor from his Network Analysis, if required, and when a network analysis is accepted.

b. Transmittal Number and Item Number: will be provided by the Contractor from ENG Form 4025 for each item.

c. Specification Paragraph Number: will be provided by the Contractor from the Submittal Register from column entitled "Specification Paragraph Number".

d. Description of Submittal: will be provided by the Contractor from the Submittal Register from column entitled "Description of Item Submitted".

e. Type of Submittal: will be provided by the Contractor from the Submittal Register from column entitled "Type of Submittal" or "Description of Item Submitted".

f. Classification: will be provided by the Contractor from the Submittal Register from column entitled "Classification".

g. Reviewing Office - Reviewer: will be provided by the Contractor from the Submittal Register from column entitled "Classification" or "Reviewer".

h. Contractor Schedule Dates: the Contractor will provide schedule dates for

"Submit Needed By" (Date the Contractor expects to submit an item. It is the Contractors responsibility to calculate the lead time needed for the government approval. Note if resubmittal is required it is the Contractors responsibility to make all adjustments necessary to meet the contract completion date.)

"Approval Needed By" (date the Contractor can receive approval and still obtain the material by need date.), and

"Material Needed By" (date that the material is needed at the site. If there is a network analysis it should reflect that date on the analysis.)

i. Contractor Action: Includes the following items: "Code" and "Submit to the Corps". These items will be completed by the Contractor and/or Contractor's Designer. The action codes will be one of the following:

A - Approved as submitted.

B - Approved, except as noted.

C - Approved, except as noted. Refer to attached sheet resubmission required.

G - Other (specify)

j. Government Action: This item includes a Government Action "Code" and "Date" and is reserved for Government use. The Government reserves the right to review any submittal for contract compliance. Receipt of an Action Code "F - Receipt Acknowledged" or failure of the Contractor to receive an Action Code by the Government, does not mean that the submittal is in compliance with the contract requirements. When used by the Government, the action code will be one of the following:

A - Approved as submitted.

B - Approved except as noted on drawings.

C - Approved, except as noted on drawings. Refer to attached ____ sheet resubmission required.

D - Will be returned by separate correspondence.

E - Disapproved (See Attached).

F - Receipt Acknowledged.

Fx - Receipt acknowledged, does not comply as noted with contract requirements.

G - Other (specify).

2. Reviewer Abbreviation code will be as follows;

G-AE - Approved by Contractor's Designer, Contractor's Quality Control Representative and Conformance Review by the Government, as applicable. Approval by the Contractor's Designer means that the submittal complies with Construction Set design submittal.

G-RE - Approved by Contractor's Quality Control Representative and Designer and approved by the Government.

For Information Only - All other submittals without a G-RE or G-AE abbreviation code, Approved by Contractors Quality Control Representative and/or Designer. The Government reserves the right review any submittal for conformance with the solicitation.

INSTRUCTIONS
ENG FORM 4025

1. DATE at the top of form will be the date submitted to the DOR which is to be completed by the Contractor.
2. TRANSMITTAL NO. Each new transmittal (i.e. G-AE, G-ED, G-RE or FIO) shall be numbered consecutively in the space provided in "Transmittal No.". This number will be the identifying symbol for each submittal. Example: "G-ED-001", "G-AE-002" "G-RE-003", "FIO-004", etc. For each new submittal or for a resubmittal, the appropriate box must be marked. Resubmittals must be designated by their original sequential number followed by an ".1", ".2", etc. for each sequential resubmittal. Example: "G-ED-001.1" (previous submittal No. G-ED-001).
3. TO: Box will contain the name and address of the office which will review the submittal. The name and address should be given in paragraph 3.5. Contractor is to complete this box after reviewing the classification provided by the government on Eng Form 4288 column f and determining the proper address.
4. FROM: Box will be the name and address of the Contractor. Contractor is to complete this box.
5. CONTRACT NO. box will contain the Contractors construction contract number (e.g., DACXXX-XX-C-XXXX).
6. CHECK ONE box will be completed by the Contractor with one box marked. If a resubmittal is provided last transmittal number will be added.
7. SPECIFICATION SECTION NO. box will be completed by the Contractor. The number will be the five digit number found in the specifications. No more than one section will be covered with each transmittal.
8. PROJECT TITLE AND LOCATION box will be completed by the Contractor.
9. Column a, will be completed by the Contractor and will contain a different number for each item submitted in that transmittal. Once a number is assigned to an item it will remain the same even if there is a resubmittal.
10. Column b, will be completed by the Contractor. The description of each item on this form will include the descriptions provided on the submittal register plus any other data necessary to describe the item. The Contractor shall submit each submittal register item all at once on one transmittal if possible. If a submittal register item can not be submitted all at once Contractor should note that in the remarks box. If a submittal register item requires several items, description shall contain submittal register description plus any additional specific descriptions. Additional items not on the submittal register will be noted in the remarks box.
11. Column c, will be completed by the Contractor. The information will be the appropriate submittal description number as described this Section or shown on the submittal register (e.g. SD-XX).
12. Column d, will be completed by the Contractor. The number of copies will be determined by the Contractor after review of submittal register for the classification of the item and after review of paragraph: SUBMITTAL

PROCEDURES of this Section.

13. Column e, will be completed by the Contractor. The Contractor shall state all applicable paragraph numbers.

14. Column f, will be completed by the Contractor. The Contractor shall state all applicable drawing sheet numbers.

15. Column g, will be completed by the Contractor and/or Contractor's Designer. The action codes will be one of the following:

- A - Approved as submitted.
- B - Approved, except as noted.
- C - Approved, except as noted. Refer to attached sheet resubmission required.
- G - Other (specify)

16. Column h, will be completely by the Contractor. A check shall be placed in this column when a submittal is not in accordance with the plans and specifications also, a written statement to that effect shall be included in the space provided for "Remarks".

17. Column i, is reserved for Government use and may or may not be provided. When used by the Government, the action code will be one of the following:

- A - Approved as submitted.
- B - Approved except as noted on drawings.
- C - Approved, except as noted on drawings. Refer to attached ____ sheet resubmission required.
- D - Will be returned by separate correspondence.
- E - Disapproved (See Attached).
- F - Receipt Acknowledged.
- Fx - Receipt acknowledged, does not comply as noted with contract requirements.
- G - Other (specify).

18. REMARKS box self explained.

19. Contractor must sign all Eng Form 4025 certifying conformance.

20. Section II will be completed by the Contractor, unless approval is required by the Government.

See reverse side of ENG Form 4025 for additional instructions.

-- End of Section --

CONTRACT NO.

PHYSICAL FITNESS CENTER, BUCKLEY AFB, CO

CONTRACTOR:
SCHEDULE DATES

APPROVING AUTHORITY

DESCRIPTION	ITEM SUBMITTED

GOVT OR A/E REVIEW

SUBMIT

APPROVA
NEEDED
BY

MATERIAL
NEEDED
BY

ACTION CODE

DATE
OF
ACTION

	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR
--	---

DATE FWD	
TO OTHER	
REVIEWER	

DATE RCD
FROM OTH
REVIEWER

DATE	OF	ACTION
------	----	--------

MAILED TO CONTR/	
DATE RCD FRM APPR AUTH	

REMARKS

(a)

(b)

(c)

(d)

(e)

(f)

(g)

(h)

(i)

(j)

(k)

(I)

(m)

(n)

o) |

1

1

(r)

SD-02 Shop Drawings

Equipment Room Drawings

1.26

G	RE
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SD-11 Closeout Submittals

Equipment Warranty Booklet

1.2.5

SD-01 Preconstruction Submittals

Accident Prevention Plan

G	RE
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TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE <i>(Read instructions on the reverse side prior to initiating this form)</i>					DATE		TRANSMITTAL NO.	
SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS <i>(This section will be initiated by the contractor)</i>								
TO:			FROM:		CONTRACT NO.		CHECK ONE: <input type="checkbox"/> THIS IS A NEW TRANSMITTAL <input type="checkbox"/> THIS IS A RESUBMITTAL OF TRANSMITTAL _____	
SPECIFICATION SEC. NO. <i>(Cover only one section with each transmittal)</i>			PROJECT TITLE AND LOCATION				CHECK ONE: THIS TRANSMITTAL IS FOR <input type="checkbox"/> FIO <input type="checkbox"/> GOV'T. APPROVAL	
ITEM NO.	DESCRIPTION OF ITEM SUBMITTED <i>(Type size, model number/etc.)</i>	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. <i>(See instruction no. 8)</i>	NO. OF COPIES	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE	VARIATION <i>(See instruction No. 6)</i>	FOR CE USE CODE
a.	b.	c.	d.	SPEC. PARA. NO. e.	DRAWING SHEET NO. f.	g.	h.	i.
REMARKS					I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated. <div style="border-top: 1px solid black; text-align: center; margin-top: 20px;"> NAME AND SIGNATURE OF CONTRACTOR </div>			

SECTION II - APPROVAL ACTION								
ENCLOSURES RETURNED <i>(List by Item No.)</i>				NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY			DATE	

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.
3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.
4. Submittals requiring expeditious handling will be submitted on a separate form.
5. Separate transmittal form will be used for submittals under separate sections of the specifications.
6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".
7. Form is self-transmittal, letter of transmittal is not required.
8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.
9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

A	--	Approved as submitted.	E	--	Disapproved (See attached).
B	--	Approved, except as noted on drawings.	F	--	Receipt acknowledged.
C	--	Approved, except as noted on drawings. Refer to attached sheet resubmission required.	FX	--	Receipt acknowledged, does not comply as noted with contract requirements.
D	--	Will be returned by separate correspondence.	G	--	Other (<i>Specify</i>)

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of ENG Form 4025-R)

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SECTION 01332

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SECTION 01332

SUBMITTALS DURING DESIGN

PART 1 GENERAL

Attachments: Attachment A, Design Certification and Transmittal Letter
DD Form 1354 - Transfer and Acceptance of Military Real
Property
Draft Army Pamphlet 405-45, Real Property Inventory
Management, Table B-16 "Preparation of DD Form 1354"

1.1 SUMMARY

1.1.1 Section Includes

This section includes general requirements for developing and submitting a design including preparation of drawings, specifications and design analyses conforming to the requirements contained in this section. See Section 01336 60 PERCENT DESIGN REQUIREMENTS and Section 01338 100 PERCENT DESIGN REQUIREMENTS for specific requirements.

1.1.2 Section Excludes

This section does not include requirements for construction submittals which are specified in Section 01330, "Submittal Procedures."

1.2 REFERENCES

The references listed below form a part of this specification to the extent referenced.

1.2.1 THE CONSTRUCTION SPECIFICATIONS INSTITUTE (CSI)

CSI Masterformat Master List of Section Titles and Numbers

1.2.2 OMAHA DISTRICT CADD STANDARDS MANUAL

(a) Omaha District CADD Standards are available at the following internet address:

ftp://ftp.nwo.usace.army.mil/pub/ED/CADD/ae/standards/

file: ACADstd.pdf for AutoCAD.

(b) Corps of Engineers Civil Standards.

ftp://ftp.nwo.usace.army.mil/pub/ED/CADD/ae/DesBld/

file: civilstd.pdf

1.2.3 WEB SITES

In addition to the web sites listed in this section, Sections 01001 SUMMARY OF WORK thru 01008 FIRE PROTECTION list web sites where design criteria

references used in this solicitation package may be found.

NOTE: FOR ITEMS (a), (b), AND (c) BELOW, REFERENCES TO RECEIVING APPROVAL FROM OTHER GOVERNMENT AGENCIES FOR ALTERNATIVE DESIGNS ARE NOT APPLICABLE TO THIS PROJECT. THE CONTRACTOR IS THE DESIGNER WHEN READING THESE DOCUMENTS.

ALL ITEMS LISTED BELOW ARE CONSIDERED TO BE A PART OF THE RFP SOLICITATION DOCUMENT (AS APPLICABLE) AND THE RESULTANT CONTRACT.

(a) TECHNICAL MANUALS (TM), TECHNICAL INSTRUCTIONS (TI), AIR FORCE MANUALS (AFM), ENGINEERING TECHNICAL LETTERS (ETL), ARMY ARCHITECTURAL AND ENGINEERING DESIGN CRITERIA (AEI), AND MILITARY HANDBOOKS (MIL HNDBK) can be obtained from the National Institute of Building Sciences Construction Criteria Base (CCB) on CD-ROM. Contact the CCB directly at (202) 289-7800 for an order form or obtain an order form at the following internet address: <http://www.ccb.org/ccbsubscribe/Subsmain.asp>. There is a regular annual subscription fee to CCB of \$700 per year. This will include CCB on CD-ROM or DVD plus unlimited internet access plus access to the new Whole Building Design Guide, now under construction and scheduled for launch in October 2001. For DOD Contractors currently receiving CCB under no-cost agreements: Contractors will receive CCB 56 and CCB 57 (to be released in August) at no cost under their current agreement. However, to continue the subscription with CCB 58 and beyond (including internet access to the CCB website), the Contractor will have to renew subscription at the regular \$700 per year fee. The previous DOD agreement making these no-cost subscriptions possible ends after September 30, 2001, so all subscription fees must be paid after that. Selected references are also available for downloading in Acrobat .pdf file format at the following internet address:

<http://www.hnd.usace.army.mil/techinfo>.

Additional web sites are as follows:

(1) TECHNICAL MANUALS, ETL's, ETC.:

www.usace.army.mil/inet/usace-docs

Click on "Information", then the desired publication.

(2) AIR FORCE DESIGN CRITERIA:

<http://afpubs.hq.af.mil>

<http://www.asc.wpafb.af.mil/cpdc/pubs/AF/index.html>

(3) UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

This includes UFGS sections referenced, but not provided in the solicitation and other UFGS sections required in developing the project specifications. Unless noted otherwise these Guide sections are located on the CD-ROM issued with solicitation (Specsintact files under a directory labeled "Guides" An Index of available UFGS sections is included in Attachment No. 3 of this RFP.

Specsintact software is available on the CCB referred to paragraph (a) above or may be downloaded at the following internet address:

<http://si.ksc.nasa.gov/specsintact/software/software.htm>

SI Version 3.0 (Version SI3.1.282) or later shall be used. The new unified submittal format shall be selected for file format. A copy of the software (SI Version 3.0) has been included on the CD-ROM issued with this solicitation. See folder: "Software", file "si3.exe".

1.3 NOT USED

1.4 DEFINITIONS

1.4.1 Contractor

Firm or company to whom award was made to design and construct the Physical Fitness Center, located at Buckley AFB, Colorado.

1.4.2 Design

Documents which include design drawings, project specifications, and design analyses (basis of design and calculations) prepared by or under the direct supervision of registered professional architects and engineers and proposed by the Contractor to meet the requirements of this solicitation.

1.4.3 Design Drawings

Documentation showing in graphic and quantitative form the extent, design, location, relationships, and dimensions of the construction to be provided by the Contractor. (Note: Shop Drawings, as defined in Section 01330, "Submittals Procedures" are not to be provided until after design drawings are determined satisfactory for construction.)

1.4.4 Designer

Architects and Engineers (A/E) associated with the Contractor who are responsible for the design and have the qualifications and experience specified herein.

1.4.5 Request for Proposal (RFP)

Documents furnished to prospective offerors containing proposal information and specifying criteria and project requirements for design and construction of a Physical Fitness Center located at Buckley AFB, Colorado. The documents include this specification, attachments, and the RFP drawings.

1.5 QUALITY ASSURANCE

1.5.1 Construction Personnel Experience

The Construction Personnel experience shall be as submitted per the requirements of Section 00110 SUBMISSION REQUIREMENTS AND INSTRUCTIONS. If, because of reasons beyond the control of the construction firm, the named individuals are not able to fulfill this obligation, replacement personnel with similar skills and experience shall be presented for acceptance by the Contracting Officer. The Contractor shall obtain the Contracting Officer's written consent before making any substitution for

these designated personnel.

1.5.2 Designer Qualifications and Experience

The designer qualifications and experience shall be as submitted per the requirements of Section 00110 SUBMISSION REQUIREMENTS AND INSTRUCTIONS. If, because of reasons beyond the control of the design team, the named individuals are not able to fulfill this obligation, replacement personnel with similar education and experience shall be presented for acceptance by the Contracting Officer. The Contractor shall obtain the Contracting Officer's written consent before making any substitution for these designated personnel.

1.6 SUBMISSION OF DESIGN DRAWINGS, SPECIFICATIONS AND DESIGN ANALYSES

1.6.1 Design Certification

Within each design submittal, the Contractor shall certify that all items submitted in the design documents (after construction award) comply with Division 1 specifications and mandatory requirements of the UFGS and designated CEGS. The criteria specified in this RFP are binding contract criteria and in case of any conflict, after award, between the RFP criteria and Contractor's submittals, the RFP criteria will govern unless there is a written and signed agreement between the Contracting Officer and the Contractor waiving a specific requirement. The Contractor shall present with the letter of transmittal for each design submittal (including the 100% corrected design (backcheck) submittal) a certification that the submittal (plans, specifications, design analysis, etc.) complies with the requirements stated above, similar to that shown at Attachment A of this section.

1.6.2 Deviations

Deviations from the RFP technical requirements shall be identified in the letter of transmittal. Deviations from the RFP technical requirements will be considered and accepted by the Contracting Officer, if the changes results in a significant improvement to the project or it exceeds the minimum RFP technical requirements.

1.6.3 Field Inspection

The Contractor shall verify field conditions which are significant to design, by field inspection, researching and obtaining all necessary existing facility as-built drawings and reproducing them for his own use as necessary, and discussing status with knowledgeable personnel. The information shall be reflected in the design documents.

1.6.4 Drawings

1.6.4.1 Software Requirements

All design drawings shall be done by the Contractor using AutoCAD 2002.dwg file format. Format shall conform to the Omaha District CADD Standards and the Omaha District CADD Design File and Sheet Naming Conventions. See Omaha District CADD Standards website listed above.

1.6.4.2 RFP Drawings

The drawings furnished with this solicitation will be furnished to the Contractor in AutoCAD 2002.dwg file format(Within 30 days of contract award).

1.6.5 Design Documents

Design documents, as required by the 60 percent and 100 percent design submittals stated hereafter, shall include construction drawings, specifications and design analysis for categories such as, but not limited to, architectural, interior design, structural, mechanical, electrical, grading, drainage, paving, and outside utility services. Specifications shall be in sufficient detail to fully describe and demonstrate the quality of materials, the installation and performance of equipment, and the quality of workmanship. Detailing and installation of all equipment and materials shall comply with the manufacturer's recommendations. The design analysis shall be for each discipline of work and shall include all features with the necessary calculations, tables, methods and sources used in determining equipment and material sizes and capacities, and shall provide sufficient information to support the design.

1.6.6 Design Reviews

A minimum of two design reviews during design will be held at Buckley AFB at the 60 percent and the 100 percent completion stages of the final design. A backcheck review will be made on the Corrected 100 percent design. Once the Corrected 100 percent design is reviewed and determined to be satisfactory for the purpose of beginning construction, the Contractor shall prepare and distribute sets of documents for construction. The Contractor shall attend the design reviews, visit the site and make other trips as necessary during the design to accomplish the work.

1.6.7 Document Packaging

The 60 percent design submittal includes the 60 percent complete site utility, and building design. These documents shall be packaged and stamped "For Review Only - 60% Design"; and each sheet of the drawings shall also be stamped. The 100 percent design submittal includes 100 percent complete site, utility, and building design and shall be stamped "For Review Only -100% Design", and each sheet of the drawings shall also be stamped. The backcheck design submittal(s) after the Government review of the 100 percent complete design shall be stamped "100% Corrected Design"; and each sheet of the drawings shall also be stamped. The 100% Corrected Design submittal is for making corrections resulting from review comments and for preparing the final project specifications. No additional time for completion of the contract will be granted to the Contractor due to insufficient design submittals. See paragraph 3.7.6 "Government Design Review and Acceptance" for additional requirements.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 DRAWINGS

Prepare, organize, and present drawings in the format specified herein. Provide drawings complete, accurate and explicit enough to show compliance

with the RFP requirements and to permit construction. Drawings illustrating systems proposed to meet the requirements of the RFP performance specifications shall reflect proper detailing for each such system to assure appropriate use, proper fit, compatibility of components and coordination with the design analysis and specifications required by this section. Coordinate drawings to ensure there are no conflicts between design disciplines and between drawings and specifications. For specific drawing requirements, see Sections 01336 60 PERCENT DESIGN REQUIREMENTS and 01338 100 PERCENT DESIGN REQUIREMENTS. The following subparagraphs cover general drawing requirements.

3.1.1 Drawings Format

Full size drawings are considered 28 inches x 40 inches. Half-size drawings are considered 14 inches x 20 inches. Title block shall be as indicated in the Omaha District CADD Standards Manual. Recommended drawing scales are specified in Sections 01336 60 PERCENT DESIGN REQUIREMENTS and 01338 100 PERCENT DESIGN REQUIREMENTS. The Cover Sheet of the Contractor prepared drawings shall bear the stamp or seal and signature of the registered architect or appropriate engineer responsible for the work and proposed to meet the RFP requirements. Drawing code numbers for the design and construction drawings shall be as follows:

AF 740-28-01

3.1.2 Drawings Sequence

Arrange drawings by design discipline in accordance with Omaha District CADD Standards Manual.

3.1.3 Drawings Required

As a minimum, the Contractor shall prepare and submit the following design drawings:

- a. Title Sheet, Index of Drawings, Legend and Abbreviations and Soil Borings.
- b. Civil Drawings
- c. Utility Drawings (Water Supply, Wastewater, Gas, and Electrical)
- d. Architectural Drawings
- e. Interior Design Drawings
- f. Structural Drawings
- g. Mechanical Drawings
- h. Plumbing drawings
- i. Electrical Drawings
- j. Fire Protection Drawings

3.2 SPECIFICATIONS

The Contractor shall develop project specifications utilizing the Division 1 Specifications furnished with this RFP; unedited Unified Facilities Guide Specifications (UFGS); designated specification sections furnished with this RFP; and the development of additional project specifications not covered by UFGS. Guide specifications are located on the CD-ROM issued with this solicitation.

The Contractor shall utilize Specsintact software.

Minimum and recommend hardware requirements are as follows:

MINIMUM REQUIREMENTS	RECOMMENDED REQUIREMENTS
486 (Windows 95/98/NT/2000)	Pentium Class Processor
8MB RAM (Windows 95)	32MB RAM
16MB RAM (Windows 98/NT/2000)	
24MB (local) 56MB (Network)	50 MB (local) 75 MB (Network)
Free Hard Drive Space	Free Hard Drive Space
SVGA Monitor	SVGA Monitor with 800 x 600 resolution
3 1/2 inch 1.44 MB floppy drive	3 1/2 inch 1.44 MB floppy drive
CD ROM Drive	CD ROM Drive
Laser Printer	Laser Printer

Note: Additional Hard Drive space is required for storing project specifications and masters.

a. Technical Specifications

The Contractor shall be required to use unedited UFGS and designated unedited CEGS sections for developing project specifications. Specification paragraphs and subparagraphs shall not be rewritten to lessen the quality of the original technical specification sections. The technical guide specifications describe the type and quality of material and installation normally acceptable for Construction, and often represent specific agreement between the Government and the applicable industry. The provision of the technical guide specification should not be changed without justification. Justifications and identification for additional materials shall be identified in the design analysis under the appropriate design discipline. Designer notes shall not appear in any design submittals. Only bracketed choices and inapplicable items shall be marked for deletion. These items shall be removed in corrected 100 percent specifications submittal. The Contractor shall complete the editing of all options in these specifications. Where designer notes are provided, the Contractor shall edit the choice in accordance with the recommendations and guidance of the Notes, except where specific guidance has been provided with this RFP (i.e. submittal paragraph). See additional requirements in Sections 01336 60 PERCENT DESIGN REQUIREMENTS and 01338 100 PERCENT DESIGN REQUIREMENTS.

b. Editing Technical Specifications (CEGS or UFGS)

- (1) ADDITIONS: If the specifications of the CEGS or UFGS does not cover a feature that is in the project, new sentences and/or paragraphs

shall be inserted in the proper locations to adequately cover the feature of work. Additions shall not lessen the quality of materials indicated by the specifications. If a new material is added, it shall be properly referenced in "Applicable Publications," "MATERIALS," "SUBMITTAL," "TESTS," and "INSTALLATION" paragraphs, as applicable.

(2) DELETION OF INAPPLICABLE TEXT MATERIAL, AS NECESSARY, TO TAILOR THE SPECIFICATIONS TO FIT THE PROJECT: After deletion has been made to all inapplicable paragraphs, subparagraphs, choices, and schedules from the body of the specifications (including but not limited to the correction of lists in "Submittals," "Tests," and "Installation" paragraphs), delete all nonapplicable references listed in the preceding "APPLICABLE PUBLICATIONS" and "MATERIALS" paragraphs. Deletions shall not lessen the quality of materials indicated by the specifications.

(3) Do not remove any special code markings for submittals, references, tests or section references, unless the text is not required.

(4) REFERENCES TO SPECIFICATION SECTIONS. The Contractor shall be responsible for coordinating references, along with the technical requirements, to specific specification sections (number and title) within the project specifications. Section references (title and number) shall be revised to reflect the titles and numbers of specification sections used.

(5) SUBMITTALS. Each section of the specifications includes a submittal paragraph which lists all applicable Contractor submittals: (a) for review and approval by the Contractor's designer and, (b) for "For Approval" or "For Information Only" by Construction field offices. Submittals shall be properly marked as outlined in the Specsintact documentation and in this section. These codings are used for automatic generation of the Submittal Register in the Specsintact Software. These codings must NOT be deleted from the text, unless the submittal is not required. The Submittal Item text between the coding shall be identical (word for word, including punctuation and spacing) to the paragraph text in the reference paragraph(s). Text may be either upper or lower case letters. An example of an submittal paragraph is listed below with text telling what each item stands for directly below each listing.

"1._ SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Fire Sprinkler Design Drawings; G-AE

SD-03 Product Data

Meters; G-RE

Regulators

SD-08 Manufacturer's Instructions

Dielectric Unions

Pressure Reducing Valves

See Section 01330: SUBMITTAL PROCEDURES for the list of Submittal Descriptions and Numbers and for submittal classification and further explanation of the submittal process.

Submittal Classifications (G-AE, G-RE, and FIO) are as follows:

G-AE - G-AE submittals are limited to those that address design work to be performed by the Construction Contractor, items that are considered extremely critical to the designer, or items that involve life safety issues. These submittals are considered to be an extension of design and must be approved by the Contractor's designer of the responsible design organization. Some examples of G-AE submittal extensions of design would include contract documents which do not show complete details of design, contract documents with performance type requirements, critical materials that would be difficult to access for corrections or when the Contractor intends to deviate or vary from the design. The Government will review all G-AE approved submittals for conformance to the Solicitation. The Government will review all submittals designated as deviating from the Solicitation or completed design.

G-RE - G-RE submittals are those that need to be considered and approved (accepted) by the field elements (Contracting Officer Representative). Some examples of G-RE submittals would include variations from the Solicitation package or 100% Corrected Design and other items as designated by the Contracting Officer's Representative. Submittals shall be reviewed and approved by the Contractor's Quality Control Representative and Designer (if applicable), prior to submittal to the Government.

FIO - For Information Only. FIO submittals are those submittals that demonstrate to the Contractor that subcontractors and suppliers are providing materials, equipment, and installation conforms to the contract requirements. FIO submittals also provide information that the Contractor's Quality Control representative needs to verify that the quality specified in the contract is being incorporated into construction of the project. These submittals shall be approved by the Contractor's Quality Control Representative and/or Designer, prior to submittal to the Contracting Officer's Representative. Some examples of FIO submittals would include reports, records, data, instructions and catalog cuts. NOTE: "FIO" IS ANY SUBMITTAL ITEM THAT DOES NOT HAVE A "G-AE" OR "G-RE" CLASSIFICATION. SEE PARAGRAPH BELOW ON HOW TO CORRECTLY IDENTIFY A FIO SUBMITTAL.

For each submittal requirement in the Guide specification, designers shall indicate a submittal type (G-AE, G-RE, or FIO) or shall delete the requirement for the submittal. For submittals that are preselected in the Guide Specification as G or GA, the designer must evaluate the submittal to determine if it is an extension of design. If so, the designer shall change the G or GA to G-D1. Designers shall delete all Certificates (Submittal Designation (SD-07)) except those preselected in the Guide Specifications or required by regulation, code, or law. The designer shall

designate these as FIO. To designate a submittal item as FIO, mark the semi-colon following the submittal item and also the submittal tags up to the Item tag for deletion (i.e. "; [], []") Designers shall designate all Instructions (SD-08), Test Reports (SD-09 or SD-06), and Closeout Submittals (SD-11) as FIO. Designers shall identify submittal classifications for all required submittals.

c. Developing Additional Project Specifications.

If the need should arise for developing project specifications on materials/items not covered in by the UFGS or designated CEGS, the Contractor shall develop specifications utilizing commercial Construction Specifications Institute (CSI), 16 Division, 3 Part Section Format. These specifications shall conform to the applicable criteria requirements indicated in the solicitation (Sections 01001 thru 01008). For these specification sections, write at the Mediumscope level of detail as described in CSI Masterformat. Use Mediumscope level section numbers and titles as identified in CSI Masterformat. Adjust section numbers which conflict with the specifications used in the Project Specifications. Each of these developed specification sections shall be in the same format as the CSI format specifications included in the UFGS (including the submittal paragraph). Commercially available guide specifications such as "SpecText" published by The Construction Specifications Institute and "MasterSpec" published by The American Institute of Architects or Unified Facilities Guide Specifications (UFGS) may be used, subject to the format, coding and submittal paragraph requirements. References to the "Architect/Engineer" and the "Owner" shall be changed to refer to the "Government" or "Contracting Officer," as appropriate. The specifications shall clearly identify, where appropriate, the specific products chosen to meet the requirements of the specifications (manufacturers' brand names and model numbers or similar product information). The Contractor shall be responsible for coordinating references, along with the technical requirements, to specific specification sections (number and title) within the project specifications. Section references (title and number) shall be revised to reflect the titles and numbers of specification sections used.

d. Division 1 Sections

Include Division 1 specifications sections (01040 AS-BUILT DRAWINGS, 01200 WARRANTY OF CONSTRUCTION, 01320A PROJECT SCHEDULE, 01330 SUBMITTAL PROCEDURES, 01355 ENVIRONMENT PROTECTION, and 01451A CONTRACTOR QUALITY CONTROL) contained in the RFP as part of the project specifications without change. Copies of these sections and other Division 1 specifications included with the RFP will be furnished (upon request) to the successful offeror in Specsintact. Any other Division 1 Specifications required by the Contract shall be the responsibility of the Contractor. No other Division 1 Specifications will be required, unless specified otherwise in this solicitation or required by the Contractor.

3.2.1 Format for Project Specifications

Submit the project specification, including a Cover page and Table of Contents, printed with a word processor (Using Specsintact software) using good quality white paper. For the 60 percent and 100 percent design submittals, editing of the CEGS and UFGS shall be shown as indicated in the Specsintact documentation for text deletions and for text insertions. The corrected 100 percent specifications with review comments incorporated shall be cleaned up (markings for insertion and deletion removed) and submitted in both hard copy and on magnetic media (A Microsoft Windows

compatible CD-ROM and compatible with the "Specsintact " micro computer software package.). The Cover page and attachments to specification sections shall be prepared in a Microsoft Word (compatible with MS Word 97) format. Carbon copies are not acceptable.

Format shall be as outlined in the Specsintact documentation.

Each specification section shall include a Section Table of Contents which is combined with the page numbering of the specification section.

The Cover page shall be similar to the RFP Cover page and shall include:

- a. Project title, Project Number, activity and location
- b. Construction contract number
- c. Construction Contractor's name and address
- d. Design firm's name and address
- e. Names of design team members (Designers of record) responsible for each Contractor prepared technical discipline of the project specification
- f. Name and signature of a Principal of the design firm

The Table of Contents shall list the 16 Divisions contained in CSI format and the specification section numbers and titles contained in the project specification.

3.2.2 Reports

The Contractor shall submit the following Specsintact reports with the 100 percent and Corrected 100 percent design submittals: Address Verification, Reference Verification, Section Verification, Bracket Verification, Submittal Verification, Submittal Register and any other reports requested by the Contracting Officer. References shall be reconciled when printing reports. The reports to be submitted for review shall be after the Contractor has corrected the errors generated by these reports. From the errors generated by the reference verification reports, fix only those errors where there is a discrepancy with the issue date of a publication (i.e., NFPA 70, revise to the latest code requirement). Address, Reference and Submittal Reconciliation shall be completed prior to submittal of the 100 percent design.

3.2.3 Construction Submittals

All construction submittals shall be in accordance with Section 01330, "SUBMITTAL PROCEDURES".

Construction submittal types and products, including the submittal description numbers and data package numbers, shall be included in the specification sections, where required. When appropriate, use specific product terms instead of the generic product terms contained in the specifications sections (e.g., asphalt shingles, built-up roofing, EPDM single ply, etc. vs roof covering; concrete masonry units, brick, metal siding, etc. vs exterior skin; mineral fiber board, block, batt or blanket, polystyrene, polyurethane, polyisocyanurate board vs insulation).

3.2.3.1 Submittal Register (Form)

Prepare and maintain a Submittal Register. The Submittal Register (ENG Form 4288 "Submittal Register" shall be prepared using Specsintact Software. Additional instructions for completing the form are contained in Section 01330, "Submittal Procedures."

Fill in columns "c" through "f" and submit with the 100 percent design submittal. The Submittal Register will be returned to the Contractor along with the reviewed and accepted design.

Resubmit the Submittal Register as a construction submittal as required in Section 01330, "SUBMITTAL PROCEDURES." The Contractor shall provide an electronic copy of the accepted submittal register, generated by the Specsintact software, three (3) working days prior to the pre-construction conference. Remaining columns will be filled in at the appropriate time and by the appropriate authorities during construction.

3.3 DESIGN ANALYSES

Prepare design analyses (basis of design and calculations) for each design discipline. Specific requirements relative to the technical content to be provided are specified herein and in Section 01336 60 PERCENT DESIGN SUBMITTALS and Section 01338 100 PERCENT DESIGN SUBMITTALS. The design analyses shall include a basis of design and calculations for each discipline. The design analyses shall be a presentation of facts to demonstrate that the concept of the project is fully understood and that the design is based on sound engineering. The design analysis for each discipline shall include:

a. A basis of design consisting of:

(1) An introductory description of the project concept which addresses the salient points of the design;

(2) An orderly and comprehensive documentation of criteria, rationale, assumptions and reasoning for system selection.

b. Calculations required to support the design.

c. Project Engineering Considerations and Instructions (ECI) for Final Design Analysis.

The Contractor shall not make reference to the RFP solicitation to avoid stating the requirements for the basis for design.

3.3.1 Format

The design analysis shall include: a cover page indicating the stage of design "PRELIMINARY DESIGN ANALYSIS": for 60 percent design submittal and "FINAL DESIGN ANALYSIS" for 100 percent design submittal, the project title "PHYSICAL FITNESS CENTER, CRWU 02-3001", fiscal year and program funding "FY 2002 MCAF", location "BUCKLEY AFB, COLORADO", who prepared the design analysis "Prepared By:" followed by Name of AE and Construction Contractor, location of AE and Construction Contractor Office involved with the design, and construction contract number; table of contents; and tabbed separations for each part of design analysis for quick reference. The cover sheet shall indicate the volume number and total number of volumes for the project. Provide a cover sheet for each volume. Submit design analyses

prepared on 8 1/2 by 11 inch white paper. The design analysis for all disciplines shall be bound in one volume, excluding calculations. Multiple volumes for individual disciplines, appropriately numbered, may be provided, when required. For Electronic media requirements, see the NOTES for the Construction Set Distribution (paragraph 3.7.1.6). Narratives shall be provided in decimal paragraph numbering system (i.e. 1, 1.1, 1.1.1, 1.1.1.1 etc.). Organize design analysis narrative into the following parts, as follows:

3.3.1.1 Part 1 - General Description.

This part will provide statements of purpose, authority and applicable criteria. A description of the project and a summary of the economic factors influencing the choice of the civil, architectural, structural, mechanical, electrical, fire safety, water supply and wastewater disposal systems used in the project shall be provided along with an indication of how initial and life costs were considered.

a. Purpose. Include the following statement under the heading of "PURPOSE":

"The purpose of this project is to provide a facility which allows for adequate comprehensive programs for both military personnel and their dependents. The anticipated average daily attendant for this facility will be 200 persons. The facility provides for adequate support for athletics, aerobic activities, auxiliary administrative support, parking and support areas."

b. Authority. Provide the following authorization statement under the heading "AUTHORITY" for the project:

"The preparation of design documents was authorized by Design Directive # 2 dated 07 August 2000."

c. Applicable Criteria. Provide a list of the general criteria that pertains to all disciplines used in the design. Specific criteria used in a particular engineering/architectural discipline shall be listed in the text of the appropriate discipline in Part 2 of the design analysis. Such criteria shall be referenced accordingly.

d. Project Description. Provide a description of the project and summary of economic factors influencing the choice of materials and systems used in the project.

3.3.1.2 Part 2 - Design Requirements and Provisions.

This part of the design analysis shall provide statements of factors considered and provided in the design along with supporting justification of design decisions and design calculations. Include narratives for each of the following areas or disciplines. See Sections 01336 60 PERCENT DESIGN REQUIREMENTS and 01338 100 PERCENT DESIGN REQUIREMENTS for specific requirements.

- a. Civil
- b. Water Supply and Wastewater
- c. Architectural

- d. Interior Design
- e. Structural
- f. Mechanical
- g. Electrical
- h. Fire Protection
- i. Environmental Protection, Compliance and Permits
- j. Not Used
- k. Sustainable Design

3.3.2 Calculations

All calculations shall be placed in separate appendix volume(s). Calculations shall include a cover page similar to the design analysis narrative cover page, a table of contents, index page and a summary of criteria for each appendix on the first pages and the project title, and location identified on every page of the calculations. All calculation pages shall be clearly legible and photo-ready. Each discipline which requires calculations shall be consecutively numbered (Example: A-1, A-2, A-3 etc. for Water Supply and Wastewater Calculations and B-1, B-2, B-3, etc. for Structural Calculations) and the date. Cite criteria from which the calculations, rationale, and formulae are extracted by publication number, title, edition and page number. The cover page and each page of calculations shall also include the names of the persons originating and checking the calculations. The person checking the calculations shall be a registered professional engineer other than the originator. In addition, the signature and seal of the appropriate registered professional engineer responsible for the work shall appear on the cover page of the calculations for each discipline. Each appendix index page shall list subtopics (e.g. for Structural - Loads, Materials, References, Wind Analysis, Footing Design, Wall Design, Column Design, etc.) with pages numbers where each of these subtopics can be found in the calculations.

Computer printouts shall be consecutively page numbered and identified similar to the calculations. Identify the computer program name, source, and version. All schematic models used for computer input shall be provided.

3.3.3 Engineering Considerations and Instructions (ECI) for Field Personnel

3.3.3.1 Separate Appendix

Under a separate appendix in the Final Design Analysis, the Design-Build Contractor shall include the following items:

- a. Features critical to the quality of the final construction product requiring special attention.
- b. Submittals requiring special attention during construction.
- c. Special user requirements or instructions.
- d. Assumed field conditions, pertinent significant aspects, or

critical phases of the project used as a basis of project design.

3.3.3.2 Format

Format for ECI's shall include the following information:

"ENGINEERING CONSIDERATIONS AND INSTRUCTIONS

Project Name: _____

Location: _____

Designer Name: _____ Phone: _____

Discipline: _____

Design-Build designers have prepared the following engineering considerations and instructions (ECI). These ECI's should be followed during the construction of the above project. If you have any questions, contact the appropriate Design-Build designer."

3.3.3.3 Distribution of ECI's

In addition to including ECI's in a separate appendix of the final design analysis and after acceptance of the 100 percent corrected design and prior to the start of construction, the design-build Contractor shall e-mail a copy of the ECI's to the appropriate U.S. Army Corps of Engineer's Field representative for his consideration with a copy also sent to the appropriate individual in following office: CENWO-CD-QR and CENWO-PM-M. The Government will provide the names and e-mail addresses to the design-build Contractor at either the pre-design or pre-construction conference.

3.4 DESIGN CERTIFICATION

The Contractor shall provide certification signed by an officer of the Contractor's company attesting that the drawings, specifications and design analyses prepared for the construction of the facility meet the requirements of the RFP. The certification shall accompany the submission of the design documents along with names and disciplines for the designers of record. This design certification shall include a list of deviations (variations) from the solicitation or accepted final design. Prepare the design certification and transmittal letter in the format shown on Attachment A included at the end of this section.

3.5 60 PERCENT DESIGN SUBMITTALS

See Section 01336 60 PERCENT DESIGN REQUIREMENTS.

3.6 100 PERCENT DESIGN SUBMITTALS

See Section 01338 100 PERCENT DESIGN REQUIREMENTS.

3.7 REVIEW BY GOVERNMENT AGENCIES

3.7.1 Distribution of Design Documents for Conformance Review

(a) Government agencies shall receive review documents thirty (30) days prior to review conferences. The documents will be in their then-present

"on-board" design status (except for the 100% design submittal). Agencies reviewing documents, and in the quantities indicated, are listed below. All documents must contain an index of contents. Work shall continue during the review period between the 60% design submission and the 60% design review conference. Work shall be 100% complete when the 100% design is submitted. Design work shall not continue during the review period between the 100% design submission and the 100% design review conference. All submittals shall be transmitted by express mail. Originals of transmittal letters should be sent to the Omaha District and copies should accompany each mail package. Transmittal letters shall indicate distribution by use of the "ATTN" code shown in the address. Design document set shall include the items listed below. Some of the Construction submittals are also listed. Design submittals shall be submitted as a complete package. The distribution listed below also applies to all design reviews and design package accepted for construction.

(b) If the Government requires more time than the thirty (30) days given, prior to either of the review conferences, the Contractor will be granted an extension of time equal to the number of calendar days of delay.

3.7.1.1 Submittal Items

The submittal items listed below are intended to identify the different design submittals required throughout the design process and select submittals required during and at the completion of Construction. Each submittal item has an Abbreviation, which will be used in conjunction with the number of required copies. See paragraphs 3.7.1.3 through 3.7.1.7 for required copies for distribution.

SUBMITTAL ITEM - ABBREVIATION

Design Analysis Narrative - **DANar**
Design Analysis Calculations - **DACalcs**
Specifications - **Specs**
Specification Error Reports - **SpecER**
Submittal Register - **SubReg**
Drawings (1/2 size) - **Dwg-1/2**
Drawings (Full size) - **Dwg-full**
Meeting Minutes with Annotated Comments and Other Attachments - **MMin**
As-Built Drawings - **Asblt**
Electronic Media Drawings - **EMDwg**
Electronic Media Specifications - **EMSpecs**
Electronic Media Design Analysis - **EMDA**
Design Certification Letter - **DCLet**
Color Board - **ColBd**
DD Form 1354 - Transfer and Acceptance of Military Real Property - **DD1354**
Environmental Protection Plan - **EP Plan**
Engineering Considerations and Instructions - **ECI**
Renderings - **Rend**

3.7.1.2 Activity Distribution Addresses

U.S. Army Corps of Engineers
ATTN: CENWO-PM-M (L. Sand)
106 S. 15th St.
Omaha, Nebraska, 68102-1618

U.S. Army Corps of Engineers
ATTM: CENWO-CD-Q
106 S. 15th St.
Omaha, Nebraska, 68102-1618

U.S. Army Corps of Engineers
Rocky Mountain Area Office (CENWO-CD-RM)
1050 S. Academy Blvd, Suite 100
Colorado Springs, CO 80910

U.S. Army Corps of Engineers
Denver Resident Office (CENWO-CD-RM-D)
ATTN: Eric Petersen
18087 E. Crested Butte Ave, Bldg. T-2
Buckley AFB Base, Aurora, CO 80011-9599

U.S. Army Corps of Engineers
Air Force Resident Engineering Office (CENWO-CD-RM)
ATTN: Bill Gust
771 Goodfellow St, Building 1319
Peterson AFB, CO 80914

Headquarters, Air Force Space Command
ATTN: HQ, AFSPC/CEC, Ray Van Horn
150 Vandenberg St, Suite 1105
Peterson AFB, CO 80914-4150

821 SPTSQ/CE
ATTN: Tom Slattery
660 South Aspen Drive, Bldg 1005
Buckley AFB Base, Aurora, CO 80011-9599

HQAFSVA/SVPAF
ATTN: Margaret Treland
10100 Reunion Place, Suite 402
San Antonio, TX 78216-4138

HQAFSPC/SVFC
ATTN: Del Herrold
150 Vandenberg St, Suite 1105
Peterson AFB, CO 80914-4210

821 SPTS/SVMP
ATTN: SSgt Ronald E. Stelly
888 Ogden Circle, Northglenn, CO 80233

821MDS/SGPZ
ATTN: Capt Kirk Tresch
275 S. Aspen St., Stop 89
Buckley AFB, CO 80011-9547

3.7.1.3 60 Percent Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

<u>Activity</u>	<u>CENWO-PM-M</u>	<u>CENWO-CD-Q</u>	<u>CENWO-CD-RM</u>	<u>HQ, AFSPC/CEC</u>	<u>821 SPTSQ/CE</u>
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Submittal
Item

DANar-	10	2	3	2	5
DACalcs-	6	2	3	2	4
Specs-*(1)	10	2	3	2	5
Dwg-1/2-	10	2	3	2	5
MMin-*(2)	10	2	3	2	5
EMDwg-	1*(3)	-	-	-	-
DCLet-	10	2	3	2	5
ColBd-	1	-	-	1	2
EP Plan	1	-	1	-	1
Rend-*(4)	1	-	-	1	1

Activity HQAFSVA/SVPAF HQAFSPC/SVFC 821 SPTS/SVMP 821MDS/SGPZ

Submittal
Item

DANar-	1	2	1	1
DACalcs-	1	2	1	1
Specs-*(1)	1	2	1	1
Dwg-1/2-	1	2	1	1
MMin-*(2)	1	2	1	1
EMDwg-	-	-	-	-
DCLet-	1	2	1	1
ColBd-	-	-	-	-
EP Plan	-	-	-	-
Rend-	-	-	-	-

*60 PERCENT SUBMITTAL NOTES:

Specific submittal requirements are identified in Sections 01332 and 01336

*(1) Copy shall show deletions and insertions (Revisions On) for all UFGS and designated CEGS specifications submitted. Process and Print Options for each section furnished shall include the following minimum requirements: Under "Sections" Print/Process Sections and Renumber Paragraphs boxes are checked; Under "Reports" a Section Table of Contents (Include Without Scope and Combine sections and section tables of contents); Under "Options" Section Dates shown, Units of Measure as english, Tags are Hidden, Notes are hidden, Revisions are shown, Start Page Numbering with "1", and Restart for each section box is checked; and Under "Header/Footer" jobtitle and jobname as a Header and Section number and Page number as a footer (similar to format shown on this section of the RFP).

*(2) To be submitted after Review Conference per requirements of this section.

*(3) Provide a CD, 100MB ZIP disk or 3.5" floppy of the following drawings:

- interior design furniture footprint
- architectural composite and area floor plans, and reflected ceiling plans
- electrical lighting, thermostat, power and communication drawings

*(4) Pencil or Computer Sketch Rendering (3 views).

3.7.1.4 100 Percent Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

<u>Activity</u>	<u>CENWO-PM-M</u>	<u>CENWO-CD-Q</u>	<u>CENWO-CD-RM</u>	<u>HQ, AFSPC/CEC</u>	<u>821 SPTSQ/CE</u>
<u>Submittal</u>					
<u>Item</u>					
DANar-	10	2	3	2	5
DACalcs-	6	2	3	2	4
Specs-*(1)	10	2	3	2	5
SpecER-	1	1	-	-	-
SubReg-	2	2	2	-	-
Dwg-1/2-	10	2	3	2	5
MMin-*(2)	10	2	3	2	5
EMDwg-*(3)	1	-	-	-	-
DCLet-	10	2	3	2	5
Colbd-*(4)	1	-	-	1	2
EP Plan	1	-	1	-	1
Rend-*(5)	1	-	-	1	1
ECI-	10	2	3	2	5

<u>Activity</u>	<u>HQAFSVA/SVPAF</u>	<u>HQAFSPC/SVFC</u>	<u>821 SPTS/SVMP</u>	<u>821MDS/SGPZ</u>
<u>Submittal</u>				
<u>Item</u>				
DANar-	1	2	1	1
DACalcs-	1	2	1	1
Specs-*(1)	1	2	1	1
SpecER-	-	-	-	-
SubReg-	-	-	-	-
Dwg-1/2-	1	2	1	1
MMin-*(2)	1	2	1	1
EMDwg-	-	-	-	-
DCLet-	1	2	1	1
Colbd-	-	-	-	-
EP Plan	-	-	-	-
Rend-*(5)	-	-	-	-
ECI-	1	2	1	1

*100 PERCENT SUBMITTAL NOTES:

Specific Submittal requirements are addressed in Section 01332 and 01338.

*(1) Copy shall show deletions and insertions (Revisions On) for all UFGS and designated CEGS specifications submitted. Process and Print Options for each section furnished shall include the following minimum requirements: Under "Sections" Reconcile References, Print/Process Sections and Renumber Paragraphs boxes are checked; Under "Reports" a Section Table of Contents (Include Without Scope and Combine sections and section tables of contents), and Reference Verification, Submittal Verification, Reference Verification, Submittal Verification, Bracket Verification, Section Verification and Submittal Register boxes are checked; Under "Options" Section Dates shown, Units of Measure as english, Tags are Hidden, Notes

are hidden, Revisions are shown, Start Page Numbering with "1", and Restart for each section box is checked; and Under "Header/Footer" jobtitle and jobname as a Header and Section number and Page number as a footer (similar to format shown on this section of the RFP).

*(2) To be submitted after Review Conference per requirements of this section.

*(3) Electronic Media Drawings:

Fifteen (15) percent of all drawings, representative of all design disciplines, shall be submitted in AutoCAD 2002 on CD-ROM to verify that the CADD standards being specified are complied with.

Provide a CD-ROM, 100MB ZIP disk or 3.5" floppy of the following drawings:

- interior design furniture footprint
- architectural composite and area floor plans, and reflected ceiling plans
- electrical lighting, thermostat, power and communication drawings

*(4) Color boards shall show actual color samples of all proposed exterior and interior finishes.

*(5) Color Copy of Rendering.

3.7.1.5 100 Percent Corrected Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

Activity CENWO-PM-M CENWO-CD-Q CENWO-CD-RM HQ, AFSPC/CEC 821 SPTSQ/CE

Submittal Item

DANar-	10	2	3	2	5
DACalcs-	6	2	3	2	4
Specs-*(1)	10	2	3	2	5
SpecER-	1	1	-	-	-
SubReg-	2	2	2	2	2
Dwg-1/2-	10	2	3	2	5
EMDwg-*(2)	1	-	-	-	-
DCLet-	10	2	3	2	5
Colbd-*(3)	1	-	-	1	2
EP Plan	1	-	1	-	1
Rend-*(4)	-	-	-	2	3
ECI-	10	2	3	2	5

Activity HQAFSVA/SVPAF HQAFSPC/SVFC 821 SPTS/SVMP 821MDS/SGPZ

Submittal Item

DANar-	1	2	1	1
DACalcs-	1	2	1	1
Specs-*(1)	1	2	1	1
SpecER-	-	-	-	-
SubReg-	-	-	-	-
Dwg-1/2-	1	2	1	1

EMDwg-	-	-	-	-
DCLet-	1	2	1	1
Colbd-	-	-	-	-
EP Plan	-	-	-	-
Rend-*(4)	-	-	-	-
ECI-	1	2	1	1

*100 PERCENT CORRECTED SUBMITTAL NOTES:

Specific Submittal requirements are addressed in Section 01332 and 01338.

*(1) Copy shall show revisions executed (deletions removed and insertions markings removed) for all specification sections submitted. Process and Print Options for each section furnished shall include the following minimum requirements: Under "Sections" Reconcile References and Addresses, Print/Process Sections and Renumber Paragraphs boxes are checked; Under "Reports" a Section Table of Contents (Include Without Scope and Combine sections and section tables of contents), and Reference Verification, Submittal Verification, Reference Verification, Submittal Verification, Bracket Verification, Section Verification and Submittal Register boxes are checked; Under "Options" Section Dates shown, Units of Measure as english, Tags are Hidden, Notes are hidden, Revisions are hidden, Start Page Numbering with "1", and Restart for each section box is checked; and Under "Header/Footer" jobtitle and jobname as a Header and Section number and Page number as a footer (similar to format shown on this section of the RFP).

*(2) Electronic Media Drawings (AutoCAD 2002) on CD-ROM shall be submitted to verify that the CADD standards being specified are complied with. Resubmittal is not required for interior design submittal, if there are no changes required to the previous submittal. If major changes are required, provide a CD-ROM, 100MB ZIP disk or 3.5" floppy of the following drawings:

- interior design furniture footprint
- architectural composite and area floor plans, and reflected ceiling plans
- electrical lighting, thermostat, power and communication drawings

*(3) Color Boards are not required if there are no changes from the previous design submittal and if only minor changes are required, submit applicable coded samples (with tape ready for application) and corrected color legend. If major changes to the color board are required, resubmit the Color boards with actual color samples of all proposed exterior and interior finishes and revised corrected color legend.

*(4) Framed and matted Renderings.

3.7.1.6 Construction Set Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

<u>Activity</u>	<u>CENWO-PM-M</u>	<u>CENWO-CD-Q</u>	<u>CENWO-CD-RM</u>	<u>HQ, AFSPC/CEC</u>	<u>821 SPTSQ/CE</u>
<u>Submittal</u>					
<u>Item</u>					
DANar-	10	2	6	2	5
DACalcs-	6	2	2	2	4

Specs-*(1)	10	2	6	2	5
SpecER-	1	1	-	-	-
SubReg-	2	2	2	-	-
Dwg-1/2-	10	2	6	2	5
Dwg-full-	-	-	1	-	1*(2)
EMDwg-*(3)	4	-	-	-	-
EMSpecs-*(3)	4	-	-	-	-
EMDA-*(3)	4	-	-	-	-
DCLet-	10	2	2	2	5
ECI-	10	2*(4)	4*(4)	2	5
Colbd-*5	-	-	1	-	-

Activity HQAFSVA/SVPAF HQAFSPC/SVFC 821 SPTS/SVMP 821MDS/SGPZ

Submittal
Item

DANar-	1	2	1	1
DACalcs-	1	2	1	1
Specs-*(1)	1	2	1	1
SpecER-	-	-	-	-
SubReg-	-	-	-	-
Dwg-1/2-	1	2	1	1
Dwg-full-	-	-	-	-
EMDwg-	-	-	-	-
EMSpecs-	-	-	-	-
EMDA-	-	-	-	-
DCLet-	1	2	1	1
ECI-	1	2	1	1

*CONSTRUCTION SET SUBMITTAL NOTES:

Specific Submittal requirements are addressed in Section 01332 and 01338.

*(1) Copy shall be the same as the 100 percent Corrected submittal and incorporate any additional comments made to 100 percent corrected design submittal.

*(2) Each drawing sheet shall be stamped (P.E.) by the appropriate Designer of Record.

*(3) Electronic Media Drawings (AutoCAD 2002), Electronic Media Specifications (Specsintact), and Electronic Media Design Analysis (MS Word (Compatible with MS 97) and Adobe Acrobat 5.0 (compatible with Adobe Acrobat 3.0)). The Design Analysis Calculations shall be included with the design analysis narrative and shall be scanned and saved in Adobe Acrobat 5.0 (compatible with Adobe Acrobat 3.0). The design analysis and calculations shall utilize bookmarks for each chapter of the design analysis and each appendix or calculations.

Electronic Media shall be on CD-ROM (Recordable compact disk with minimum 650 megabyte capacity)

*(4) In addition, the Contractor shall e-mail the designated offices a copy of the ECI per requirements stated in this section.

*(5) Reflects all changes made through accepted 100 Percent Corrected Design.

3.7.1.7 As-Built Submittals

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal

item are listed below.

<u>Activity</u>	<u>CENWO-PM-M</u>	<u>CENWO-CD-Q</u>	<u>CENWO-CD-RM</u>	<u>HQ, AFSPC/CEC</u>	<u>21 CES/CECC</u>
<u>Submittal</u>					
<u>Item</u>					

Asblt-	*	-	-	-	-
DD1354-	1	1	1	1	1

<u>Activity</u>	<u>HQAFSVA/SVPAF</u>	<u>HQAFSPC/SVFC</u>	<u>821 SPTS/SVMP</u>	<u>821MDS/SGPZ</u>
<u>Submittal</u>				
<u>Item</u>				

Asblt-	-	-	-	-
DD1354-	1	1	1	1

*NOTES for As-Built Submittals:

*See Section 01040, AS-BUILT DRAWINGS for requirements.

3.7.2 Review Comments:

For each design review submittal, the Contractor will be furnished comments from Omaha District and other agencies involved in the review process approximately 21 days after receipt and review conference will be held approximately 30 days after receipt. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he/she shall clearly outline, with justification reasons for noncompliance at the design review conference in order that the comments can be resolved. Annotated comments, including the disposition of all comments shall be furnished in writing by the Contractor within five (5) days of the review conference and shall be recorded in the Contractor prepared Meeting Minutes described in paragraph 3.7.6.1. The written documentation shall be forwarded in the same quantities to the distribution list shown in paragraph: "Distribution of Design Documents for Conformance Review" above.

3.7.3 Using Automated Review Management System:

Conference and post conference action: Government personnel, from the above Government Agencies, will present review comments for discussion and resolution. Copies of comments, annotated with comment action agreed on, will be made available to all parties before the conference adjourns. Unresolved problems will be resolved by immediate follow-on action at the end of conferences. Valid comments will be incorporated. After receipt of final corrected design documents upon incorporation of all backcheck comments (as many backchecks as are deemed necessary by the Government will be conducted), the Omaha District will recommend acceptance to proceed with construction. The Government, however, reserves the right to not accept design document submittals if comments are of too great a significance and to withhold design payments. In this case, every effort shall be made during follow-up action between the Contractor and the Omaha District to resolve conflicts and problems such that documents can be fully accepted. However, if final submittal(s) are incomplete or deficient, requiring correction by the Contractor and resubmittal for review, the cost of rehandling and reviewing will be deducted from payment due the Contractor

at the rate of \$1350.00 (for each design discipline requiring resubmittal) per submittal. "Design Disciplines" in this paragraph consist of Architectural, Structural, Interior Design, Mechanical, Electrical, Civil/Site work, and Fire Protection.

3.7.4 Delays

Delays caused by the Contractor in completion of the 60 percent design, the 100 percent design or the 100 percent corrected design will not be considered as valid reason to delay completion of the entire design. The Government may not be held liable for delays caused by re-submittal efforts caused by designs submitted, which are rejected by the reviewers.

3.7.5 Reproduction (For Construction):

Upon the Government's completion of the review of the 100% Corrected Design submittal, the Contractor shall reproduce copies of the design documents (accepted for the purposes of beginning construction), subject to the incorporation of the Corrected 100% design review comments. The Cover Sheet of the Contractor prepared drawings shall bear the stamp or seal and signature of the registered architect or appropriate engineer responsible for the work and proposed to meet the RFP requirements. The date on each drawing shall reflect the month and year that the drawings were cleared for the purposes of beginning construction. The Cover Sheet of the drawings, Cover Sheet of the Specifications, and Cover Sheet of the Design Analysis shall include the date that the design documents were cleared for the purposes of beginning construction. The Contractor shall provide corrected 100 percent specifications in both hard copy and electronic media (Specsintact Software Version 3.1.382 or later). Distribution shall be as indicated above. The originals will be retained by the Contractor for recording of as-built conditions. Upon completion of the project, the accepted design documents corrected to reflect as-built conditions shall be supplied to the Government. See Section 01040 AS-BUILT DRAWINGS for as-built drawing requirements.

3.7.6 Government Design Review and Acceptance

3.7.6.1 Design Review Conference and Post-Design Review Conference Action:

All design review conferences shall be held on Buckley AFB. Government personnel will forward review comments to the Contractor for discussion and resolution prior to the design review conference. Copies of comments, annotated with comment action agreed on, will be made available to all parties before the design review conference adjourns. Unresolved problems will be resolved by immediate follow-on action at end of conferences. Valid comments will be incorporated. Upon satisfactory Government review of the 100 percent corrected design documents, the Omaha District will formally provide Government acceptance necessary to initiate construction. The Government, however, reserves the right to not accept design document submittals if comments are of too great a significance and to withhold design payments. In this case, every effort shall be made during follow-up action between the Contractor and the Omaha District to resolve conflicts and problems such that documents can be fully accepted. However, if final submittal(s) are incomplete or deficient, requiring correction by the Contractor and resubmittal for review, the cost of rehandling and reviewing will be deducted from payment due the Contractor at the rate of \$1350.00 (for each design discipline requiring resubmittal) per submittal. The Contractor shall submit to the Contracting Officer within five (5) calendar days, two two (2) copies of meeting minutes summarizing major decision

points and issues which requires resolution and the action office. Annotated comments shall be attached to these minutes.

3.7.6.2 Complete Design Documents

The Contractor shall submit complete design documents in the same quantity and to the same offices listed above in paragraph **"Distribution of Design Documents for Conformance Review"**, for each corrected 100 percent design submittal (one or more) until the Government is satisfied that all review comments have been addressed and resolved.

3.7.6.3 Accuracy and Completeness of Design

Reviews by the Government of the design documents shall not be construed to be an endorsement of the accuracy or completeness of the design. Design deficiencies or omissions in the accepted design shall be the responsibility of the Contractor.

3.7.7 DD Form 1354, Transfer and Acceptance of Military Real Property

The Contractor shall provide, for acceptance, a completed DD Form 1354 "Transfer and Acceptance of Military Real Property" (Copy attached at the end of this section) with the 100 percent corrected design documents. DD Form 1354 shall be filled out in accordance with Draft Army Pamphlet 405-45 "Real Property Inventory Management", Table B-16 "Preparation of DD Form 1354" (Copy attached) and Army Pamphlet 415-28 "Guide to Army Real Property Codes" (Copy is available at the following website: <http://www.usapa.army.mil/gils/>). The number of copies of the completed DD Form 1354 shall be same as that required for the 100 percent corrected design documents.

3.8 REVISIONS TO THE ACCEPTED DESIGN

(a) The accepted design will be used by all parties involved in construction and in administration of the contract. Therefore, it is imperative that the design documents be kept up to date and an effective system of making and distributing changes be implemented. Since changes to the design increase risk of construction errors and deplete available administrative resources, every effort shall be made to minimize revisions to the accepted design. One of the measures of the Contractor's effectiveness of management will be how well the goal of minimizing changes to the accepted design is met. The use of effective quality control during design, and utilization of experienced and capable designers are some of the means that are expected to be used to accomplish this goal.

(b) If revisions to the accepted design become necessary, the procedures described in Section 01330 SUBMITTAL PROCEDURES will be used to accomplish the revisions. The revisions will be considered a "Variation" and shall be submitted as a "G-RE" submittal. All the requirements in paragraph: "Variations" in Section 01330 SUBMITTAL PROCEDURES will apply to revisions to the accepted design. All design analysis and calculations necessary to establish that the proposed revision satisfies applicable design requirements shall be included in the submittal.

Attachment A

[Contractor's Letterhead]

[Date: _____]

[Contract No. _____]

[Reviewing Component Address]

Subj: DESIGN CERTIFICATION AND TRANSMITTAL FOR
[Project Title _____]
[Project Location _____]
[Contract No. _____]

Gentlemen

Enclosed are the following documents, which I hereby certify are in compliance with the RFP requirements of the subject construction contract and can be used to commence construction subject to Government approval:

1. Design Drawings
2. Project Specification
3. Design Analysis
 - a. Civil
 - b. Water Supply and Wastewater Collection
 - c. Architectural
 - d. Interior Design
 - e. Structural
 - f. Mechanical
 - g. Fire Protection
 - h. Electrical
 - i. Environmental Protection, Compliance and Permits
 - j. Not Used
 - k. Sustainable Design
4. Submittals Register

[Typed Name and Signature of an
Officer of the Contractor's company]

5. All other Design Submittals
6. Deviations

Copy to:
[As standard with the Contractor]

-- End of Section --

TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY														Form Approved OMB No. 0704-0188			
PAGE OF PAGES																	
Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, Va 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.																	
1. FROM (Installation/Activity/Service and Zip code)			2. OPERATING UNIT		3. DISTRICT CODE		4. OPERATING AGENCY		5. DATE		6. JOB NUMBER		7. SERIAL NUMBER		8. CONTRACT NUMBER		
9. TO (Installation/Activity/Service and Zip code)			10. OPERATING UNIT		11. DISTRICT CODE		12. OPERATING AGENCY		13. ACCOUNTING NUMBER		14. ACCOUNTABLE OFFICE NUMBER		15. TYPE OF TRANSACTION <div style="display: flex; justify-content: space-between; font-size: x-small;"> <div>A. <input type="checkbox"/> NEW CONSTR. <input type="checkbox"/> EXISTING FAC. <input type="checkbox"/> CAPITAL IMP. <input type="checkbox"/> OTHER (Specify)</div> <div>B. <input type="checkbox"/> BENF/O <input type="checkbox"/> PHYSICAL COM. <input type="checkbox"/> FINAN. COM. <input type="checkbox"/> OTHER (Specify)</div> </div>			16. PROJECT NUMBER	
ITEM NO. 17	CATEGORY CODE 18	FACILITY (Category description) 19	NO. OF UNITS 20	TYPE 21	UNIT OF MEAS. 22	TOTAL QUANTITY 23		COST 24		DRAWING NUMBERS 25		REMARKS 26					
27. STATEMENT OF COMPLETION: The facilities listed hereon are in accordance with maps, drawings, and specifications and change orders approved by the authorized representative of the using agency except for the deficiencies listed on the reverse side.										28. ACCEPTED BY (Signature)					DATE		
TRANSFERRED BY (Signature)					DATE					TITLE (Post Engr./Base Civ. Engr./Navy Rep.)					29. PROPERTY VOUCHER NUMBER		
TITLE (Area Engr./Base Engr./DPWO)																	

30.

CONSTRUCTION DEFICIENCIES

31. REMARKS

INSTRUCTIONS

This form has been designed and issued for use in connection with the transfer of military real property between the military departments and to or from other government agencies. It supersedes ENG Forms 290 and 290B (formerly used by the Army and Air Force) and NAVDOCKS Form 2317 (formerly used by the Navy).

Existing instructions issued by the military departments relative to the preparation of the three superseded forms are applicable to this form to the

extent that the various items and columns on the superseded forms have been retained. Additional instructions, as appropriate, will be promulgated by the military departments in connection with any new items appearing hereon.

With the issuance of this DD form, it is not intended that the departments shall revise and reprint manuals and directives simply to show the number of this DD form. Such action can be accomplished through the normal course of revision for other reasons.

Draft Department of the Army Pamphlet 405-45

Real Property Inventory Management

Table B-16, Preparation of DD Form 1354

THIS PAGE IS LEFT BLANK INTENTIONALLY

Hammerhead

Gang latrine style constructed mid-1950s to mid-1960s. Has company dining facility at one end, giving T-, or hammer, shape to building.

H-Shape

Gang latrine style constructed in 1950s. Two main sections with connecting piece most commonly constructed in shape of letter H. Sometimes in shape of letter A.

Historic Permanent construction before 1950 (perhaps all were before 1940).

Any permanent construction preceding H-shape.

Other

Post-1950 permanent construction not included in above list

Table B-16

Preparation of DD Form 1354 (Transfer & Acceptance of Military Real Property)

Upon receiving information on a DD Form 1354 the real property office will enter the information in the appropriate fields/screens in the automated real property system. The voucher register will be updated with the information and the DD Form 1354 filed in the real property records.

Purpose. This table provides the procedures for completing DD Form 1354 (Transfer and Acceptance of Military Real Property) by all responsible parties. A DD Form 1354 will be prepared for transfer of construction by the District Engineer, transfer of construction accomplished by the designated facility engineer, acquisitions, construction, disposal, purchased or leased real property, reactivation of excess installations, transfers of real property of non-appropriated fund or non-Army agencies to the government, transfers of accountability for usable research and development and acceptance of other construction, and any other real property accountability action.

Detailed Instructions. DD Form 1354 will be filled in as

follows:

1. From: This block will include the name of the transferring agency: organization, installation, division, etc. It will also include the address and zip code. This information is for those performing the work or making the transfer.

2. Operating Unit: For other than Army use.

3. District Code: For other than Army use.

4. Operating Agency: For other than Army use.

5. Date: This is the preparation date of the DD Form 1354.

6. Job Number: The job number depends on who initiates the job. If the Director of Engineering and Housing (DEH) or the Director of Public Works (DPW) initiates the job then they will put a job number in this block and it will relate to a special project (for contract) or a DA 4283 job order (in house).

7. Serial Number: This is the voucher number at source, e.g., DPW, COE.

8. Contract Number: If a project has been let to a contractor then the contract number will be that assigned by the contracting office in the Director of Contracting or the District Engineer contracting office.

9. To: This will include the name of the receiving organization, installation, division, etc. where the work has been performed or where the transfer has been made. The address and zip code will also be included.

-

10. **Operating Unit:** Other than Army Use.

11. **District Code:** Other than Army use.

12. **Operating Agency:** Other than Army Use.

13. **Accounting Number:** Other than Army Use.

14. **Accountable Officer Number:** Other than Army Use.

15. **Type of Transaction:** This will identify whether it is new construction, capital improvement or other. It will also indicate whether it is the final cost of the project, beneficial occupancy or physical completion. The District Engineer or in house project officer must indicate on the DD Form 1354 whether cost shown is preliminary (for Beneficial Occupancy/Physical Completion DD Forms 1354) or final cost. If it is a preliminary (estimated cost) the real property officer will create a suspense file to ensure that the district furnishes an updated DD Form 1354 with final construction cost. Update to the database should be handled accordingly. Final costs may take several years if legal claims are involved.

a. Block A: Insert an 'X' in the appropriate box of block A to indicate whether the transaction involves new construction, transfer of existing facilities or capital improvements to existing facilities. If the "Other" box is used, explain the transaction in Item 31, "Remarks" on the back of the DD Form 1354.

b. Block B: If block A has been checked for new construction then use this block to indicate whether transaction is being made at time of beneficial occupancy, physical completion, or financial completion. If the "Other" box is used, explain the transaction in Item 31, "Remarks" on the back of the DD Form 1354.

16. **Project Number:** Enter the project number and code number assigned to identify the project. For construction,

enter the public law authorizing the work.

17. Item Number: Identify each entry on the DD Form 1354 by giving it an item number. Each portion of a facility with a unique DA PAM 415-28 category code must be identified with a separate line number.

18. Category Code: This column will identify the five-digit design use category code associated with the design of the facility as indicated in the DA PAM 415-28. Each facility may have more than one design use; however, they must be identified as separate items in block 17.

19. Facility (Category Description): The description for the facility will be entered as it relates to the category short title in the DA PAM 415-28. Each facility number should be identified in this field as it relates to the construction.

20. Number of Units: Self-explanatory.

21. Type: This will indicate the type of construction: "P" = Permanent, "T" = Temporary and "S" = Semi-permanent.

22. Unit of Measure UM1, UM2: This indicates the gross area or capacity of a facility as it relates to the design use category code of the facility. See DA PAM 415-28.

23. Total Quantity: This indicates the total quantity of the facility as it relates to the unit of measure assigned to the facility: e.g., UM1 = square feet (SF), acres (AC) or square yards (SY), UM2 = each (EA), families (FA), etc.

24. Cost: Cost for each line item entry must be entered. All engineering, design and inspection costs associated with a project must also be captured on the DD Form 1354.

a. If the cost is the final cost figure for the line

item it will carry an alphabetical suffix of "F" indicating that it is a final cost. If the cost is preliminary it will contain a "P" indicating it to be a preliminary cost and not final.

b. If the cost is a capital improvement to an existing facility previously accounted for, enter only the amount which will increase the cost of the real property, i.e., enter the amount by which the general ledger balance is to be increased.

c. All engineering, design and inspection costs will be entered on the DD Form 1354 for the real property office to capitalize as project costs. These will be identified as a separate entry.

Types of funds are mandatory and will be shown in column 24 or column 26 (i.e.: MCA, Housing, and NAF).

25. Drawing Number: Indicates the number assigned to a particular drawing of a construction project as it relates to the different components to a facility: the architectural drawing would be number one, the plumbing would be number two, etc. Using the old manual system the drawing numbers would relate to each page of the project, however, now that the automated system of CADD is operational at many installations this is not the case.

26. Remarks: Self-evident. This field may be used to note any information about the drawing numbers, project number, reason for the DD Form 1354: change in unit of measure, reason for increase/decrease in cost, etc.

27. Statement of Completion: Indicates the signature/title of the individual responsible for the transfer of the facility/equipment. The date is self explanatory, however, the date must be prior to or the same as the date of acceptance in item 28 on the 1354.

28. Accepted By: Indicates the signature/title of the individual responsible for accepting the transfer of such properties. The date is self-explanatory.

29. Property Voucher Number: This number will be assigned sequentially by the receiving real property office to indicate the voucher occurrence that the transaction was accepted/vouchered.

Example: V123-90, This indicates that this is the 123rd voucher for FY 90. When an installation transfers from one to another, the losing installation fills in block 7 and the gaining block 29.

30. Construction Deficiencies: This should indicate any deficiencies of the design or construction of the project.

31. Remarks: Self-explanatory. If the "Other" box is checked in item 15 an explanation should be noted in the "Remarks" column.

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SECTION 01336

60 PERCENT DESIGN REQUIREMENTS

PART 1 60 PERCENT DESIGN SUBMITTALS

Attachments: Code Analysis
ADA Architectural Design Checklist

For general submittal requirements, See Section 01332 SUBMITTALS FOR DESIGN.

1.1 SITE PLANNING

1.1.1 Drawings

1.1.1.1 Location Plan and Vicinity Map

The Location Plan and Vicinity Map provided in the Request For Proposal (RFP) shall be updated as necessary and included in the drawings. The Location Plan shall include the Contractor's Access Route, Staging Area, and the Project Site.

1.1.1.2 Removal Plan

The removal plan will show the existing physical features and condition of the site before construction. Each physical feature to be removed shall be hatched as indicated on the standard legend sheet, a legend on the removal plan, and properly noted: to be removed, to remain, or to be relocated. The Removal Plan shall be prepared at the same drawing scale and use the sheet boundaries as the Site Plan.

1.1.1.3 Site Plan

The Site Plan shall show all the site layout information necessary to field locate the building, parking lots, roads, sidewalks, and all other appurtenances to be constructed as part of the project. All major site work to be constructed will be dimensioned for size and location. The Site Plan will identify all site-related items such as: curbs, pavements, walks, bollards, trash enclosures, retaining walls, chiller units, electrical transformers locations, etc. in accordance with a standard legend sheet or with additional legends or notes. Drawing scales of 1"=20', 1"=30 and 1"=50' are acceptable scales for the Site Plan. The contractor shall consider the project's construction area, drawing legibility, number of sheets required in choosing the drawing scale. The Site Plan, prior to adding the dimensions and notes, should serve as the base sheet to other Plans, such as: Utilities Plan, Grading and Drainage Plans and Landscape Plan. Existing and proposed contours or utility lines shall not be shown on Site Plan. Physical features that will remain after the proposed construction has been completed shall be shown. This plan, or the Location Plan, will also show any free zones, construction limits, etc. Whenever the Site Plan occupies more than one sheet of drawings, a Key Plan shall be included. Additional plans showing specific areas of the site in smaller scales can be included if more detail is necessary.

1.1.1.4 Site Details

The Contractor shall provide designs and details as necessary for site furnishings, accessories, accessible parkings stalls and ramps, bollards, signage, striping, and any other site structure or item requiring a detail for clarity and construction accuracy.

1.1.1.5 Landscape Plan

A detailed Landscape Plan showing trees, shrubs, ground covers, seeded and sodded areas, shall be prepared by the Contractor. The Landscape Plan shall be prepared by a fully qualified, experienced professional Landscape Architect. The Contractor shall specify types of plant materials that are locally grown, commercially available and acclimated to the project environment. The Landscape Plan shall include a plant materials schedule or listing. This schedule shall include botanical names, common names, key, size and the method of transplanting. The Landscape Plan shall also show all unsurfaced ground areas disturbed by construction within the project limits with these areas shown to be seeded, sodded, or mulched as required.

1.1.1.6 Landscape Details

The Contractor shall verify the methods of planting to meet the project site/installation requirements and provide the necessary Landscape Details to perform the contract design work. Details shall reflect local practices and conditions for installation.

1.1.2 Specifications

Provide a listing by title and number of all Technical Specifications proposed for use in the final site design.

1.1.3 Design Analysis Narrative

Design analysis shall include the following:

1.1.3.1 Design References

Design references used in preparing the site design.

1.1.3.2 Basis, Specific Goals, Objectives and Priorities For Site Design

The Design Analysis should give the basis, specific goals, objectives and priorities for site design of the project. Identify, explain and document use of design criteria and how the design meets goals, objectives and priorities. Identify the preferred site development concept. Document pollution prevention measures and other environmental considerations made during design. The 60 percent Design Analysis must be approved and accepted before Final Design.

1.2 CIVIL

1.2.1 Drawings

1.2.1.1 Grading and Drainage Plan

A preliminary grading and drainage plan showing the proposed layout of all new culverts and storm drains shall be provided at the same scale as the site plan. Existing grading contours shall be indicated at 1 foot contour intervals. Tentative new grading contours shall be shown. Indicate

proposed finished floor elevation of the new buildings. Provide location and description of benchmarks and indicate vertical and horizontal datums.

1.2.1.2 Grading Sections

Provide grading sections through the site showing finished and existing grades, pavement sections in detail, slope percentage, ditches, slopes of finished grades, finish floor elevations in the new building, and identification of main features such as parking areas, building, and walks, etc.

1.2.1.3 Typical Pavement Sections

Provide typical pavement and road sections and details showing interface between new and existing pavements and new pavements of different sections.

1.2.2 Specifications

Provide a listing by title and number of all Technical Specifications proposed for use in the final civil design. List shall be coordinated with the requirements of Section 01002 SITE WORK.

1.2.3 Design Analysis Narrative

Design analysis shall include the following:

1.2.3.1 References

Design references used in preparing the civil design.

1.2.3.2 Grading

A narrative of the grading design and criteria used.

1.2.3.3 Pavements

A narrative of the pavement design and criteria used plus design calculations used to obtain the pavement design.

1.2.3.4 Drainage

A narrative of the drainage design and criteria used. Include information on the storm drain and culvert pipe materials anticipated to be used.

1.2.3.5 Basis, Specific Goals, Objectives and Priorities For Civil Design

The Design Analysis should give the basis for the civil design and should establish specific goals, objectives and priorities for civil design of the project. Identify, explain and document use of design criteria and how the design meets goals, objectives and priorities. Identify the preferred site development concept. Document pollution prevention measures and other environmental considerations made during design. The 60 percent Design Analysis must be approved and accepted before Final Design.

1.3 GEOTECHNICAL

See Structural Design Requirements.

1.4 WATER SUPPLY AND WASTEWATER

1.4.1 Drawings

1.4.1.1 Water Distribution and Sewage Collection Systems Plan (including building services)

Provide all existing utilities and above ground features which may pose as an obstacle (i.e., water, sewer, gas, electrical, etc.) on the basic site plan layout. Exclude siting notes and dimensions from the plan. Provide all proposed new water and sewer lines with preliminary sizes. This shall include all new service lines up to the 5 foot building line. Show the proposed locations of all new manholes, fire hydrants, valves (including PIV's), and connection points.

1.4.2 Specifications

Specifications shall be coordinated with the plans and include all items. Provide a listing of specifications to be provided. Provide a complete copy of special sections to cover those subjects for which no UFGS or designated CEGS guide specifications are used or available.

1.4.3 Design Analysis Narrative

Design analysis shall include the following:

1.4.3.1 References

Provide design references used in preparing the water and wastewater design.

1.4.3.2 Water Supply and Distribution Systems

A narrative of the water supply and distribution systems design and applicable criteria used shall be provided. The waterlines will be sized for basic plus all bid options. Include the peak and average domestic demands, the fire flow required and the available flow and residual pressures. A description of the water distribution system, a listing of allowable piping materials, hydrant flow test data and preliminary calculations necessary to support equipment, piping sizes, fire and domestic demands, etc., shall be provided.

1.4.3.3 Wastewater and Sewers

Based on existing information the sanitary sewer system in the vicinity of the proposed facility is assumed to be adequate to carry the flows expected to be generated by the new facility. A narrative of the wastewater supply design and applicable criteria used shall be provided. Include the preliminary calculations used to design the average and peak contributing flows. Field verify the available capacity and full flow capacity of the existing system to ensure that it will be adequate for the flows generated by the new facility. Include the available capacity and full flow capacity in the design analysis. Preliminary calculations necessary to support equipment and piping sizes and a listing of allowable piping materials shall be provided.

1.4.4 Gas Distribution

A narrative of the gas distribution design and applicable criteria used shall be provided. Include the peak and average flow demands, the flowrate required and the available pressures. A description of the gas

distribution system, a listing of allowable piping materials, test data and preliminary calculations necessary to support equipment, piping sizes, flow demands, etc., shall be provided similarly to water supply and distribution system. **The exterior gas line shall be sized for the basic plus bid options.**

1.5 ARCHITECTURAL

1.5.1 Drawings

Sixty percent architectural drawing submittal shall be a complete set of architectural drawings without large scale details. All other drawings shall be complete except referencing of the large scale details.

1.5.1.1 Floor Plans

Provide a double line Floor Plan, drawn at the largest scale practicable to include the entire building on a single sheet. See paragraph on Drawing Scales for plan scale requirements. Floor plans shall essentially be complete with the exception of large scale detail referencing. Floor plans shall be scaled double-line drawings showing the functional arrangement, pocheing, location of all openings and plumbing fixtures, all section cuts, wall types, all notes and leaders, all general notes, and all dimensions shall be completed. The plans shall indicate door swings, door numbers and window type; door and window schedules are required. A north arrow shall be shown on each floor plan. Enlarged toilet and stair plans shall also be included. The first composite plan sheet shall include a gross area tabulation comparing the actual square meters with the authorized square meters of the facility. Architect-Engineer suggestions for plan improvement shall be fully shown and justified. Include the following:

- Overall, control, and door/ window opening dimensioning.
- Match lines for combining individual portions of floor plans.
- Room names and numbers.
- Structural column or bay indicators.
- Wall and building section cuts.
- Door swings and door numbers.
- Window types.
- Area in square meters.
- General notes.
- All Floor & Wall Patterns/Borders.

When dimensioning, use arrowheads, not dots or slashes. Where major structural elements are included as parts of architectural detailing, do not indicate sizes. These elements should all be fully defined as part of the structural design documents. Major elements of mechanical and electrical equipment affecting room size or shape, shall be shown on the architectural plans to a practicable extent and coordinated with other respective disciplines. When applicable, Government-furnished, Contractor-installed, or Government-furnished and Government-installed items shall be shown as a dashed line.

1.5.1.2 Reflected Ceiling Plans

Reflected ceiling plans shall be complete including all electrical lights, mechanical supply & diffusers, notes, complete legends and pocheing of all materials to be used. See paragraph on Drawing Scales for reflected ceiling plan scale requirements.

1.5.1.3 Roof Plan

Roof plans shall be complete including all notes, legends, slope indications, gutter and downspout locations, and roof overflow drains. All elements located on the roof shall be coordinated with all disciplines. See paragraph on Drawing Scales for roof plan scale requirements. Roof mounted equipment should be limited to exhaust fans, vents, and intakes, no large pieces of equipment shall be allowed to be mounted on the roof.

1.5.1.4 Building Elevations

Provide all building elevations complete showing the appearance and architectural treatment. Elevations shall be dimensioned to show total height, and relation to grade. Critical elevations such as top of finish floor, top of steel, etc. shall be indicated. All notes for materials shall be included. See paragraph on Drawing Scales for Exterior Building Elevation scale requirements.

1.5.1.5 Building Sections

Building cross section and longitudinal sections shall be included to show general interior volumes, construction methods, and height of ceilings and partitions. Identify materials used and necessary dimensions. See paragraph on Drawing Scales for Building Section scale requirements.

1.5.1.6 Wall Sections

Drawings shall include all wall sections and stair section conditions including corridors, showing vertical control elevations and dimensions, with all materials labeled. The sections should normally be cut through doors, windows, and other critical wall section locations. Wall sections shall not be broken. Additional details shall be included when necessary to illustrate important or unusual features. All horizontal dimensions shall occur on the plans and vertical dimensions on the sections and elevations. See paragraph on Drawing Scales for Wall Section scale requirements.

1.5.1.7 Room Finish Schedules

Room finish schedule shall be complete in accordance with Corps of Engineers (COE) standard format.

1.5.1.8 Furniture Placement Plan

Provide a layout showing all desk, Lockers, and furniture that will be incorporated into the design of this project.

1.5.1.9 Door, Window, and Louver Schedules

Door schedule shall be complete in accordance with Corps of Engineers (COE) standard format. Schedule shall include door and frame types, except referencing to door details and hardware sets. Window and louver schedules shall be complete including window and louver types except referencing to details.

1.5.1.10 Fire Ratings

Wall ratings, and fire hazards shall be clearly indicated as required by Fire Protection criteria. Wall fire ratings shall be graphically shown by

a continuous symbol or pocheing within the wall on a Fire Protection /Life Safety Plan. When other functions coexist with the fire protection functions, their integration shall be clearly indicated, with an analysis that describes how both functions will be served. Provide a separate, floor plan which makes an accurate presentation of these various features and functions.

1.5.1.11 Drawing Scales

Architectural work shall be drawn at the scales listed below. Other scales may be used only by written authorization through the Technical Manager, Omaha District. Units of measurements shown on the drawings shall be done in English units. All disciplines should use the same scale for plan sheets. The following is a comparison guide to establish equivalent scaling of drawings:

	ENGLISH
Composite Plans (Note 1)	$\frac{3}{32}" = 1'-0"$
Floor Plans	$\frac{1}{4}" = 1'-0"$
Reflected Ceiling Plans	$\frac{1}{8}" \text{ to } \frac{1}{4}" = 1'-0"$
Detail Plans (Note 2)	$\frac{1}{2}" = 1'-0"$
Roof Plans	$\frac{3}{32}" = 1'-0"$
Exterior Elevations	$\frac{1}{8}" \text{ to } \frac{1}{4}" = 1'-0"$
Interior Elevations	$\frac{1}{8}" \text{ to } \frac{1}{4}" = 1'-0"$
Interior Toilet Elevations	$\frac{1}{2}" = 1'-0"$
Building Cross Sections	$\frac{1}{4}" \text{ to } \frac{3}{8}" = 1'-0"$
Wall Sections	$\frac{1}{2}" \text{ to } \frac{3}{4}" = 1'-0"$
Stair Sections	$\frac{1}{2}" = 1'-0"$
Details (Note 2)	$3" = 1'-0"$
Wall Types	$1" = 1'-0"$
Fire Protection Plans (Note 1)	$\frac{3}{32}" = 1'-0"$

Notes:

1. Scale of composite plan shall be as required so that the entire facility is drawn on one sheet without break lines.
2. The goal of this requirement is that the details be large enough to show all fixtures, accessories, equipment, materials, manner of construction, clearances required for proper maintenance, and complete dimensions. Toilet rooms and Equipment

1.5.1.12 Legends

Standard architectural material symbols used on the drawings shall be provided as a separate architectural legend drawing located just in front of the architectural drawings in the set. Additional material symbols should be added to the Legend Sheet as needed for the project.

1.5.1.13 North Arrows

North arrows shall be oriented the same direction on all plan sheets and by all disciplines; including site and civil drawings. Plan north shall be "up" or the left on the drawings. Indicate true north on composite plan drawings. North arrows shall be located approximately at the same location on all sheets.

1.5.1.14 Modular Design

Modular Design practices shall be followed in the design of all masonry buildings or components of buildings. Dimensions shall be figured to whole or half-unit lengths of standard units in order to reduce on-site cutting of masonry.

1.5.1.15 Symbols

The Room and Door Numbering system shall be consistent. The standard symbols for Amendments (a triangular box) or Modifications (a type of circular box, see the chapter on Drafting Criteria) to the contract shall not be used for any other purpose, and care must be taken to avoid using even similar appearing but technically different symbols. Room numbering shall start at the main entrance and proceed clockwise around functional areas.

1.5.1.16 Schedules

Schedules for room finish, doors, windows, louvers, etc., shall be clear and complete. As many columns as necessary should be provided in order to present the essential information. The "Remarks" column should not be used as a substitute for an information column. Normally a single item should be presented on each schedule line. Other scheduling methods as standard with the A-E may be used if approved by written authorization from the Project Architect, Omaha District.

1.5.1.17 Notes

Notes may be placed on drawings to reduce the amount of repetitive drafting, provided that clarity is not lost. General notes should be placed at the right-hand edge of the sheet and, if possible, should be located on the first sheet in the set. Notes that pertain to each drawing however, should be placed on each drawing.

1.5.1.18 Dimensions

Dimensions must be complete, accurate and fully coordinated. Dimensions should be to points easily measurable in the construction, and should be laid out to eliminate refiguring in the field. Dimensions should be tied-in to column lines, etc., to facilitate checking. Plan dimensions for frame construction should be to face of stud (or sheathing) for exterior walls, to one face of stud for interior partitions, and to centerline of openings. For masonry construction, dimensions should be to one or both nominal faces of masonry and to jambs of openings.

1.5.1.19 Facility Elevation

The level of finished floor shall be indicated as EL.= 0000. Elevations for footings, etc., shall be related to this figure. Sea level elevations shall not be shown on the building drawings.

1.5.1.20 Access to Utilities

All utilities within the building, such as piping, ductwork, electrical work, etc., shall be concealed in finished areas. Provide plumbing chases in toilet areas. The clear space above ceilings and the size of chases must be carefully figured to accommodate piping slopes and connections, ductwork crossovers, and similar situations. Access must be provided to valves, cleanouts, etc. Space provided for utilities systems must be adequate but should not be excessive.

1.5.1.21 Reflected Ceiling Plans

Reflected Ceiling Plans shall be provided for all spaces in the building. Reflected ceiling plans shall show the ceiling tile layout and location of gypsum wallboard and other ceiling types where applicable. All light fixtures, air diffusers, grilles, registers, PA speakers, sprinkler head layout, smoke and heat detectors - if ceiling mounted, and other ceiling mounted items will also be shown on the reflected ceiling plans. The fixtures and other equipment shall be laid out in a regular pattern symmetrical with the ceiling tile grid, or symmetrical with the room centerlines, columns, windows, or other feature that dominates. All ceiling mounted items shown shall be fully coordinated with all other disciplines.

1.5.1.22 Sketches

All sketches presented during the design phase shall be reduced to 8-1/2" by 11" and included in this design analysis to document the design options and decisions evaluated during the design process.

1.5.1.23 Rendering Sketches

At this phase, the Contractor shall submit three (3) sketches or three (3) computer generated birds-eye views of the Physical Fitness Center. The views shall be taken at an angle from the west, northwest and southwest looking toward the east, which includes the front entrance. The views shall depict walks, parking, vehicles, landscaping, fencing, and other surrounding features. One view will be chosen at this phase for finalizing as a color rendering. See Section 01338 100 PERCENT DESIGN REQUIREMENTS.

1.5.2 Technical Specifications

1.5.2.1 Use of Technical Guide Specifications

Technical Guide Specifications (available to the Contractor as identified in Section 01332, SUBMITTALS DURING DESIGN) are prepared by the Corps of Engineers to achieve the maximum uniformity in contract specifications. The technical guide specifications describe the type and quality of material and installation normally acceptable for Corps construction, and often represent specific agreement between the Corps and the applicable industry. The provisions of the technical guide specifications should not be changed without justification. The 60% submittal shall include a draft edited specifications of all the applicable sections. Items added or deleted in these specification sections shall be evident. Complete descriptions including specific size, gauge, and configuration are included in the technical Guide Specifications for a wide variety of items. The designer must be familiar with the technical Guide Specification requirements in order to provide details fully coordinated with the technical specification descriptions. Terminology used on the drawings shall be the same as used in the Technical Guide Specifications. Where it is desirable to detail a variance with the standard provisions of the Technical Guide Specifications, the specifications must be revised to coordinate with the details.

a. New Guide Specifications

New guide specifications shall be limited to those specialty type items not covered in the regular sections of Technical Guide Specifications.

1.5.3 Design Analysis Narrative

The Design Analysis shall be essentially complete with emphasis on the following:

1.5.3.1 Basic Criteria Statement

A statement indicating the basic criteria to be applied to the design including type of construction (noncombustible, etc.), category of construction (permanent, etc.), major fire protection and exit requirements, etc..

1.5.3.2 Description of Materials

A description of materials for all major building components and of all interior and exterior finishes ascertaining their matching of existing. The description of materials must include type of exterior wall construction, room finish schedule, window types, panel materials, etc. The description of materials should follow the continuity of the Military Handbook 1190. The description of finishes may be presented in schedule form.

1.5.3.3 Additional Criteria/Clarification

A list of items on which additional criteria, clarification, or guidance is required.

1.5.3.4 Reason for Selection

The written presentation must include the designer's reasons for selecting specific materials, architectural compatibility, and architectural treatment in all cases in which the reason for selection is not obvious.

1.5.3.5 General Parameters

The design analysis shall follow the format described herein.

- a. The purposes, overall functions, and total capacities of the facility.
- b. The design theme or visual appearance of the exterior and interiors of the building, and how this facility coordinates with the image criteria of the installation on which it will be constructed.
- c. The number of personnel to use facility.
- d. The type of activities and equipment involved.
- e. The anticipated life of the functions to be accommodated.
- f. The category of construction; permanent

1.5.3.6 Functional and Technical Requirements

- a. Functional areas, occupant capacities, and allocation, including a functional relationship matrix.
- b. All items of equipment, required.

- c. Occupational safety and health.
- e. Energy conservation energy budget goals.
- f. Sound and vibration control.
- g. Interior service areas.
- h. Physical security; lock and keying, intrusion-detection, alarms, restricted access areas, interior guard support, and ties to local authorities.
- i. Justification for selection of exterior and interior finishes and materials.
- j. Moisture Vapor Control.
- k. Lessons learned incorporated into the design.

1.5.3.7 Design Objectives and Provisions

- a. Adaptation of the building to the size, shape, and orientation of the site.
- b. Building layout to establish convenient circulation flows during normal operation and emergency evacuation activities, for materials, equipment, services, and people.
- c. Grouping spaces into sound-compatible zones and protective construction zones, e.g., for fire and storm.
- d. Space layout compatible with modular (structural and environmental) support systems.
- e. Type of construction materials, architectural systems, and finishes.
- f. Building expandability/changeability.
- g. Physical security.
- i. Energy conservation. (insulation, orientation)
- j. Acoustical design.
- k. Moisture vapor condensation design.
- l. Composition of masses and spaces architectural compatibility and architectural details to reflect the design theme and desired image, and the scale and nature of the activities involved.
- m. Perception of the building details and volumes. (Specific provisions made, e.g., an identifiable sequence of viewing positions for experiencing the interior and exterior architectural design.)
- n. Enhancement of materials and systems maintenance and operation.

- o. Economy of building construction, operation, and maintenance: life-cycle cost effectiveness.

1.5.3.8 Coordination with Installation or Outside Agencies

- a. Physical security support.
- b. Occupational safety and health, as required.
- c. Government furnished equipment.
- d. Operations and maintenance support.

1.5.3.9 Checklists

Fire Protection Code Analysis shall be included in the Design Analysis. See Attachments Code Analysis and ADA Architectural Design Checklist at the end of this section.

1.5.4 Design Analysis Calculations

- a. Net room areas, occupant capacity and gross building areas.

(Categorize areas and capacities under the titles of "Operational Space Requirements", "Administrative Space Requirements", "Storage Space Requirements", and "Support Space Requirements".)

- b. U-values for each wall, window, door, or roof type studied or selected.
- c. Acoustics.
- d. Rainfall intensity relative to roof area and roof drain size and number calculations.

1.6 INTERIORS

1.6.1 DESIGN ANALYSIS/NARRATIVE

The design analysis shall contain an explanation of the desired image or visual appearance of the interior of the facility and the design intent.

1.6.2 TECHNICAL SPECIFICATIONS

Appropriate UFGS guide specifications shall be provided and coordinated with the drawings and design analysis. Specifications shall be edited to identify proposed product and installation requirements. Use SECTION 09915 Color Schedule to specify exterior and interior finish colors. Where materials or installation requirements are not covered in the provided specifications, information shall be prepared to cover these items. In addition to guidance provided in SECTION 01332 on editing technical specifications, data and sample submittals for all interior and exterior finishes (including but not limited to interior design and architectural specifications) shall be "G-AE" submittals.

1.6.3 COLOR BOARDS AND LEGENDS

Color boards shall show actual color samples of all proposed exterior and interior finishes. A color board legend shall accompany the boards and shall clearly identify all finishes. Clarification of finish placement shall be required when more than one color of a single finish is proposed. Color boards shall be 8 1/2" x 11" in size and provided in a three ring binder. Include project name and location, design stage and date on the front cover and spine of the binder.

1.7 FURNITURE FOOTPRINT

A furniture footprint indicating proposed furniture layout shall be included in the drawings. It shall verify that rooms are functional and adequately sized, and that accessways are sufficient. Furnishings are GF/GI (Government Furnished/Government Installed) and not part of the construction contract. Drawings shall be 1/4-inch = 1 foot scale. Provide a CD, 100MB ZIP disk or 3.5" floppy of the following drawings:

- interior design furniture footprint
- architectural composite and area floor plans, and reflected ceiling plans
- electrical lighting, thermostat, power and communication drawings

Drawings shall be provided in AutoCadd (verify at time with Corps the version that is required.) All reference files and customization shall be included.

1.8 STRUCTURAL

1.8.1 DRAWINGS

Drawings shall include roof framing plans, floor slab plans and foundation plans for buildings. Roof framing plans shall show sufficient details to clearly indicate the type of framing system used, size and spacing of members and their elevations. The location of all columns or pilasters shall be shown, and all building structural members shall be at least outlined. The sizes, locations and elevations of footings shall be shown. Slab plans shall be coordinated with the Architectural sheets and shall indicate the locations of structural walls and masonry partitions, recessed slabs and contraction or construction joints. Concrete slab-on-grade thicknesses and sections shall be shown. Proposed treatment of unique or complex features and details shall be shown on the drawings. Elevation views, sections and details necessary to illustrate the design at a 60% level of completion shall be provided. Drawings shall also include overall building plan dimensions, north arrows, and design notes. Drawings shall be done at a scale appropriate for the design, in no case however, shall plan type drawings be done at a scale smaller than 1/8-inch = 1 foot or detail type drawings at a scale smaller than 1/2-inch = 1 foot.

1.8.2 SPECIFICATIONS

For this 60% design submittal the Contractor shall provide a listing by title and number of all Technical Specifications proposed for use in the final structural design.

1.8.3 DESIGN ANALYSIS NARRATIVE

Design analysis shall follow the format described in Section 01332

SUBMITTALS DURING DESIGN, Paragraph 3.3, "Design Analyses" and the specific content shall be essentially as outlined below.

1.8.3.1 Design Criteria and References

A list of design criteria references, such as Department of the Air Force Manuals, Army Corps of Engineers Technical Instructions, ACI Standards, AISC Specifications, etc., and any other references which were used in the design of the project shall be included in the narrative.

1.8.3.2 Design Loads and Conditions

A list of structural design loads and conditions shall be provided, including:

- Snow load parameters;
- Wind load parameters
- Seismic design parameters;
- Roof live loads;
- Floor live loads, identifying each loading with usage and the room or space where used, including vibration loads;
- Foundation design criteria, including the design depth for footings, allowable soil bearing pressure, equivalent fluid densities (or lateral earth pressure coefficients) for the design of earth retaining structures and building components, modulus of subgrade reaction, and any other pertinent data derived from the recommendations of the Final Foundation Analysis report (See Attachment #2 included as an appendix to this solicitation), a copy of which shall be included as an Appendix to the design analysis.

1.8.3.3 Structural Materials

A list of structural materials shall be provided, together with the stress grades and/or ASTM designations, as applicable, for structural steel, concrete, and reinforcing steel; the series for steel joists; and identification of the proposed use of each material in the structure.

1.8.3.4 Availability of Precast Concrete Units

Where precast concrete units of particular cross section(s) and concrete strength are a part of the structural design, verification of their availability from precast producers in the project vicinity shall be documented. Acceptable documentation consists of letters from the producers or a written statement by the Contractor identifying the name and address of the precaster(s), description of units and concrete strength(s) available, date when availability was verified, and name of Contractor's staff member who obtained the verification.

1.8.3.5 Description of the Structural System

A concise description of the proposed structural systems selected for the building, together with the reasons for its selection, shall be provided. All principal elements of the structural system selected shall be described. Typically, these shall include:

- Primary supporting members for the roof;
- Masonry walls, type of material, and whether load bearing

or non-load bearing, with location of load-bearing walls defined, and measures taken to compensate for expansion/contraction and crack control in masonry walls;

- The proposed system for resisting lateral forces (wind and earthquake) and transferring them to the ground, whether diaphragms, chord bracing, shear walls, braced or moment resisting frame, etc;
- Foundations, description of special designs to accommodate existing site conditions;
- Concrete slab-on-grade floors, description of floor surface finish treatment, accommodation of live loads, and the use, location and types of crack control joints;
- The proposed treatment of any unusual structural loadings, features or unique solutions to structural problems, including a description of measures taken to mitigate the effects of vibrations due to running and exercise activities.
- Identification of any major vibrating elements and measures taken to isolate them.

1.8.4 DESIGN ANALYSIS CALCULATIONS

The extent of the structural calculations shall be indicative of a design which has reached a 60% level of completion. Computations shall include the determination of snow, wind, seismic, dead and live loads. Computations shall show sizing and spacing of structural members for roof framing, sidewalls and foundation sizes, as appropriate to the systems to be used for these elements.

1.9 MECHANICAL

Compliance with the design requirements for the building mechanical systems will be determined by a review of the submitted 60 percent drawings, design analysis, calculations, energy analysis, any life cycle cost analysis required and specifications. Any conflicts in the design requirements or lack of thorough understanding of the nature and scope of work shall be identified and resolved prior to submittal of the 60 percent design.

1.9.1 DESIGN DRAWINGS

The 60 percent design drawings shall be fully coordinated with the design analysis. Provide sufficient plans, piping diagrams, sections, air & water flow diagrams, mechanical room layouts, details, schedules, and control diagrams/sequences of operation etc. shall be provided as necessary to define the required design intent. Floor plans shall use the architectural

floor plans as a basis, with the building outline half-toned. Coordinate with architecture design for provisions of access panels for all concealed valves, traps, fire dampers and air vents etc.. Coordinate with architectural design so that louvers shown on architectural drawings match damper sizes for the respective openings as shown on Mechanical drawings. Unless otherwise indicated, all floor plans shall be drawn at 1/8-inch = 1 foot scale and show all room names and numbers. An exception to this are administrative areas being air-conditioned shall be 1/4-inch = 1 foot scale and mechanical room plans shall be 1/2-inch = 1 foot scale. Sheet reference number sequencing shall be in accordance with the Omaha District CADD Standards Manual. Submittal drawings shall include, but not limited to, the following:

1.9.1.1 Mechanical Index Sheet

An index sheet identifying all mechanical drawings shall be provided, including those drawings anticipated to be provided in the 100 percent design submittal. Index shall include drawing design file numbers, drawing numbers, sheet numbers, and drawing descriptions.

1.9.1.2 Mechanical Abbreviation, Legend, and General Notes Sheet

This sheet shall include all mechanical abbreviations and symbols that will be used on the drawings. Symbols shall be grouped into sections; as a minimum, provide sections for Plumbing, Heating, Miscellaneous Piping, Valves and Fittings, and ventilation including a separate sheet for HVAC controls legend.

1.9.1.3 Exterior Utility Drawings

The following exterior utility drawings shall be provided:

a. Removal Plan

All existing exterior mechanical utilities and utilities which are to be removed shall be indicated on the Site Removal Plan located in the civil section of the drawing package.

b. Utility Plan:

All existing and new mechanical utilities shall be indicated on the Site Composite Utilities Plan located in the civil section of the drawing package. The location of existing exterior utilities shall be thoroughly checked and indicated on plans and profiles, thus preventing interference with new services. The utility drawing shall indicate all new utilities, including tie-in points, isolation valves and existing utilities which have or are to be abandoned.

1.9.1.4 Plumbing Drawings

The following plumbing drawings shall be provided:

a. Plumbing Plans

Plumbing plans showing the design and tentative layout of the domestic hot and cold water distribution systems; make-up water piping; soil, waste and vent piping; and storm water drainage system shall be provided. Plans shall show all anticipated routing of piping systems from the connections within the structure to a point 5 feet (1.5 meters) outside the structure.

The grade of all drain lines shall be calculated and invert elevations established. All electrical panels/equipment and pertinent HVAC equipment (expansion tanks, boilers, AHU's, pumps, lawn sprinkler system, etc.) shall be outlined in half-tone on the plumbing plans. Plans may combine building areas and be drawn at 1/8-inch = 1 foot scale as long as legibility is not compromised. Plumbing fixtures and drains shown on the drawings shall be designated by the same identification system used in the Technical Specification and Plumbing Fixture Schedule. **This shall include riser diagrams.**

b. Enlarged Mechanical Room Plumbing Plan

An enlarged mechanical room plumbing plan drawn at a minimum 1/4-inch = 1 foot scale shall be provided. Plan shall show layout of all plumbing equipment and piping within the rooms. In addition to all the plumbing systems required, the plan shall show half-toned outlines of all HVAC equipment located in the room, gas service, including meter/regulator assembly, lawn sprinkler apparatus, the fire protection entrance and risers, and the outline of any electrical panels or equipment located in the room.

c. Plumbing Detail and Schedule Sheet

The following details shall be provided: water heaters, and water service entrance. The provided plumbing fixture schedule and a contractor generated water heater schedule shall be provided.

d. Enlarged Toilet Room Plans

Enlarged toilet room plans showing all fixtures, water, waste, and vent piping shall be provided for each toilet area. Enlarged plans shall be drawn at a minimum 1/4-inch = 1 foot scale. Also, separate riser diagrams shall be provided for each toilet area.

1.9.1.5 Mechanical HVAC Drawings

Show on mechanical HVAC drawings, all items of mechanical equipment, including boiler room equipment, HVAC equipment layout, air handling units, air distribution and exhaust systems, etc., to determine proper space allocation within the intent of the architectural layout requirements. Plans, elevations, and sections shall be developed sufficiently to insure that major equipment items, piping, and ductwork cause no interference with structural members, electrical equipment, etc. The following HVAC drawings shall be provided:

a. Mechanical HVAC Plans

Mechanical HVAC plans showing the design and tentative layout of the hot water piping distribution system, chilled water piping distribution system and equipment, the air supply and distribution systems, and the ventilation and exhaust systems shall be provided. Air supply and distribution systems shall show all ductwork, including supply and return ductwork, ductwork to diffusers, and all diffusers. For the 60 percent submittal, all ductwork may be shown as single-lined. The final design submittal shall show all ductwork as double-lined. All electrical panels/equipment and pertinent plumbing equipment shall be outlined in half-tone on the HVAC plans.

b. Enlarged Mechanical Room HVAC Plans

Enlarged mechanical room HVAC plans showing all mechanical systems and drawn at a minimum 1/4-inch = 1 foot scale shall be provided. Plans shall show layout of all equipment, AHU'S piping, and ducts located within the rooms. Equipment shall include (but not limited to) air handling units with associated outside air intakes, relief air, and supply/return ducts; exhaust/supply fans, mechanical room ventilation intake/relief openings, gas service entrance, combustion air opening, unit heaters, HW pumps, CW pumps, boilers, chillers, condensing units, air separators, expansion tanks, water treatment, variable frequency drives and temperature control panels. Openings for relief air and outside air shall be coordinated with size of architectural louver. Plans shall show dedicated access space for items requiring maintenance to include tube pull space for boilers and heat exchangers. In addition to all the mechanical HVAC systems required, the plan shall show half-toned outlines of all major plumbing equipment, the water service entrance, fire protection entrance and riser, lawn sprinkler apparatus, and any electrical equipment or panels located in the room.

c. Mechanical Room Sections:

For each air handling unit within the mechanical room, a mechanical room section view shall be provided showing, but not limited to, all AHU components, ductwork connections/routing, and relationship to adjacent structural features.

d. Hot Water & Chilled Water System Flow Diagram:

Provide flow diagram showing the facility piping system including the pumps and connected hot water & chilled water equipment. Each pump and equipment item shall show associated flow rate. All thermometers, pressure gauges, isolation and control valves, bypass piping, freeze protection piping, etc. shall be shown on the flow diagram. Coordinate heating and chilled water flow with control valves so that adequate three-way valves are provided to insure minimum floor rates through boiler and chiller at low building load demands.

e. Mechanical Detail Sheets:

Installation details showing all specification requirements such as isolation and balancing valves, thermometers, pressure gauges, equipment pads, strainers, vents, hangers, vibration isolation, etc. shall be provided for each item of mechanical equipment. As a minimum, the following mechanical details shall be provided to the extent they are included in the design:

- Refrigerant Piping Diagrams
- Hot Water Boilers and Piping Diagram
- Chilled water piping Diagrams
- Chilled water pumps
- Hot Water Pumps
- Hot water coil piping
- Chilled water coil piping

- Expansion Tanks
- Air Separators
- Horizontal Unit Heaters
- Vertical Unit Heaters
- Chemical Shot Feeders
- Gas Service Entrances
- Cabinet Unit Heaters

Air Handling Units
Wall Propeller Supply/Exhaust Fans
In-line Supply/Exhaust Fans
Relief Hoods
Relief Vents
Exhaust Hoods
Dehumidification unit
Water-Water Heat Exchangers
Solar Collectors

f. Mechanical Schedule Sheets

Schedules, with preliminary capacities, shall be provided for each item of mechanical equipment. Furnished typical equipment schedules shall be used whenever possible and shall be revised and completed as necessary to suit the project requirements. In addition to the furnished schedules, damper and control valve schedules shall also be provided at Final submittal

1.9.1.6 HVAC Control Drawings

Simplified, one-line type control schematics showing all control system interface points and detailed sequence of operation shall be provided for all mechanical equipment and systems. Sequence of operation for each item of equipment and system shall be sub-sectioned into paragraphs describing discreet operational requirements. See section 01006 MECHANICAL REQUIREMENTS for specific DDC HVAC control system drawing requirements. The following drawings shall be provided:

HVAC Controls Legend:

This sheet shall include all control abbreviations and symbols that will be used on the HVAC control drawings. Furnished Controls Legend sheet shall be used as a basis for all abbreviations and symbols used on the Final Control Drawings.

a. Misc Systems

These sheets shall include all miscellaneous equipment items such as supply/exhaust fans, unit heaters, radiant floor heating, infra-red heaters, controls, air compressors, etc. that are not interlocked to the main HW, CW or air handling unit systems. Provide control schematic and sequence of control for each item of equipment and system on the same sheet.

b. Hot Water System

Provide a boiler and pumping system control schematic and sequence of operation.

c. Not Used

d. Air Conditioning System:

Provide a condensing unit, evaporator and chilled water pumping system control schematic and sequence of operation. Include all items of equipment that are interlocked to each system.

e. Air Handling Systems

For each air handling system, including outside air makeup system, provide

a control schematic and a sequence of operation. Include all items of equipment that are interlocked to each system.

f. Control Points Lists

Provide Local Control Panel control points lists for all items of equipment and systems, for each AHU, HW, or CW system identifying all anticipated temperature control system input/output points. The format for defining the input/output points shall be as identified on the furnished Example Control Point List sheets and as defined in section 01006.

1.9.2 TECHNICAL SPECIFICATIONS

UFGS shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product and installation requirements for the facility. The provided specifications define the minimum requirements for items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals and testing that shall be provided for the facility. Where items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals or testing requirements are not covered in the provided specifications, special Sections within each guide specification(s) shall be prepared to cover those subjects. Specific items of equipment identified in the provided specifications but not required for the facility shall be edited out. Government approval is required for any specification addition or deletion.

The following UFGS guide specifications shall be edited and coordinated with the drawings and design analysis to identify the proposed product and installation requirements for the facility:

02556A	Gas Distribution System
13080A	SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT
13814A	Building Preparation for Energy Monitoring and Control System (EMCS)
13600A	Solar Water Heating Equipment
14240A	Elevators, Hydraulic
15070A	Seismic Protection for Mechanical Equipment
15080A	Thermal Insulation for Mechanical Systems
15181A	Chilled and Condenser Water Piping and Accessories
15400A	Plumbing, General Purpose
15500A	Desiccant Cooling Systems
15190A	Gas Piping Systems
15569A	Water and Steam Heating; Oil, Gas or Both; up to 20 MBTUH
15620A	Liquid Chillers
15895A	Air-Supply, Distribution, Ventilation, and Exhaust System
15951A	Direct Digital Control For HVAC
15990A	Testing, Adjusting and Balancing of HVAC Systems
15995A	Commissioning For HVAC Systems
xxxxx	Pool Water Heating System to be provided by Contractor
xxxxx	Pool Dehumidification Unit/System to be provided by Contractor
16261N	Variable Frequency Drives Systems Under 600 volts

The SECTION 15951A DIRECT DIGITAL CONTROL FOR HVAC has been edited completely for this project and is to be considered as an extension of the Specification Requirements.

1.9.3 DESIGN ANALYSIS NARRATIVE

The narrative portion of the design analysis shall contain a narrative description and analysis for each of the mechanical portions of the design.

The basis and reasons for specific engineering decisions, special features, unusual requirements, etc., shall be explained or summarized as applicable. If it is necessary to deviate from criteria or standard practice, reasons shall also be included. Design statements shall be provided in sufficient detail to enable the reviewer to get a clear picture and understanding of all included work so that approval will be granted. Narrative shall be complete relative to scope and intended design approaches. The total scope projected to final design shall be outlined in a form that will be conveniently adapted, expanded, and detailed at the final design stage. If alternatives were to be evaluated and selected by the designer, findings (pros and cons) and conclusions shall be included. The design analysis shall carry a complete narrative (including Energy Budget Analysis) for every item and system covered in the design, and shall include, but not be limited to, the following:

U-values for each wall, window, door, or roof type selected.

1.9.3.1 Index

Provide a design analysis index identifying all main and sub-paragraph headings.

1.9.3.2 Project Summary

Provide a brief description of the mechanical design objectives.

1.9.3.3 Applicable Criteria

A list of all applicable criteria used for basis of design.

1.9.3.4 Technical Specifications

Edited Technical Guide Specifications that will be used for the project.

1.9.3.5 Design Conditions

A list of Mechanical HVAC design conditions including elevation, latitude, heating/cooling degree days, winter and summer outside design temperatures, inside design temperatures for all spaces, ventilation rates, etc. shall be provided.

1.9.3.6 System Descriptions

Provide a complete description of all building systems; include the designer's reasons for selecting specific materials, systems, etc. in which the reason for selection is not obvious. System descriptions shall be include, but not limited to, the following:

- Plumbing Systems
- Exterior Gas Distribution System
- Interior Gas Piping Systems
- Hot Water Heating Systems
- Exhaust Hoods
- Air Supply and Distribution Systems
- Ventilation and Exhaust Systems

- Temperature Control Systems
- Seismic Protection
- Chilled Water Systems
- Refrigeration Systems
- Pool Water Heating System
- Supplemental Solar Domestic hot water heating system
- Supplemental Solar Pool water heating system

1.9.4 DESIGN ANALYSIS CALCULATIONS

The Design Analysis calculations shall provide an estimate of the heating, cooling, and ventilation loads to determine a preliminary selection of the type and size of mechanical equipment to be used. Design calculations shall be provided in sufficient detail to enable the reviewer to get a clear understanding of all work to allow approval. Backup data shall be furnished to support basic design decisions related to sizing of major equipment and materials, performance of specific systems or equipment. Manufacturer's catalog data sheets shall be provided for each item of equipment selected. Calculations may be performed by manual or computerized procedures. Use of standardized charts, curves, tables, graphs will generally be acceptable for portions of required calculations lieu of specific calculation procedures. Such data must be from a recognized source which is identified in the design analysis and shall be included with the calculations. Design calculations and computations shall be provided for all systems and shall include, but not limited to, the following:

1.9.4.1 Index

Provide a design analysis index identifying all calculation items.

1.9.4.2 Design Conditions

A list of Mechanical HVAC design conditions including elevation, latitude, heating/cooling degree days, winter and summer outside design temperatures, inside design temperatures for all spaces, ventilation rates, etc. shall be provided.

1.9.4.3 Zone Air-Conditioning Loads

Preliminary cooling calculations shall be prepared using the Cooling Load Temperature Differential/Cooling Load Factors (CLTD/CLF) Method as described in the ASHRAE Handbook Fundamentals.

1.9.4.4 Block Air-Conditioning Loads

Preliminary cooling calculations shall be prepared using the Cooling Load Temperature Differential/Cooling Load Factors (CLTD/CLF) Method as described in the ASHRAE Handbook Fundamentals including any growth factor indicated in section 01006, MECHANICAL REQUIREMENTS.

1.9.4.5 Chilled Water Pump Selections

Include pump flow calculations and catalog selection data indicating dimensions, connection sizes, rpm, horsepower, and efficiency.

1.9.4.6 Heating Loads

Preliminary block heating load calculations, including a 15 % piping losses

allowance.

1.9.4.7 Heating Load Summary

A tabular summary of all heating load calculations for each area or room, including combustion air heating, shall be provided.

1.9.4.8 Boiler Selection

Include boiler capacity adjustments for altitude, inefficiency, and net rating. Provide catalog data indicating input capacity, net output capacity, dimensions, and water and flue size connections. If a high efficiency condensing type boiler(s) is proposed, insure the heating coils in all equipment are sized (larger) to take into account the lower return water temperature upon which these boilers are normally selected.

1.9.4.9 Hot Water Pump Selection

Include pump flow calculations and catalog selection data indicating dimensions, connection sizes, rpm, horsepower, and efficiency.

1.9.4.10 Combustion-Air Requirements

Include combustion air quantity and free area calculations, louver selection, combustion air heating requirements, and selection of heating equipment.

1.9.4.11 Unit Heater Selections

For each area requiring a unit heater, provide data on capacity, weight, and horsepower.

1.9.4.12 Mechanical Ventilation

For each area or room requiring mechanical ventilation for cooling; provide calculations similar to zone air-conditioning, louver selection, and additional calculations to be provided are:

External static pressure calculations for all fans
Control damper Cv calculations at Final submittal
Catalog Fan data

1.9.4.13 Toilets/Janitor Room Ventilation

Provide calculations, catalog fan data, and louver selections, for each toilet area.

1.9.4.14 Air Handling Units

A tabular summary of all airflow calculations for each area or room shall be provided on each air distribution system for fan sizing. Additional calculations to be provided are:

External static pressure calculations for all fans
Control damper Cv calculations at Final submittal
Catalog Fan data

1.9.4.15 Domestic Water Demand

Calculations for determining the size of the domestic cold water supply line to the building shall be provided.

1.9.4.16 Domestic Hot Water Demand

The design guidance provided for service water heating in ASHRAE Handbook HVAC Systems and Applications shall be followed to determine the domestic hot water demand for the facility. Provide catalog data for the domestic water heaters.

1.9.4.17 Electrical Load Summary

A summary of all mechanical equipment and the associated electrical load requirements shall be provided.

1.9.4.18 Additional calculations

Additional calculations to be provided are:

- pipe sizing calculations for the CW & HW, & gas piping systems
- CW & HW pump head calculations
- CW & HW expansion tank sizing
- Control valve Cv calculations at Final submittal
- Solar systems defined in section 01006

1.9.5 ENERGY CONSERVATION

Mechanical designs shall be economical, maintainable and energy conservative and solar water preheating systems with full consideration given to the functional requirements and planned life of the facility. Emphasis shall be given to heat reclamation, outside air usage and other energy conservation measures for mechanical systems. Each major item of proposed mechanical equipment shall have a net efficiency rating that is equal to or exceeds the net efficiency ratings of similar or equal equipment of the four manufacturers each having one of the four highest ratings that meets the design criteria.

1.9.6 AIR POLLUTION CONTROL

Air pollution control shall be incorporated in all designs. The Architect-Engineer shall investigate the latest Using Service, Local, State, and Federal regulations and standards, analyze and report on requirements in the design analysis, and include in the design as applicable. The most stringent of all regulations and standards shall be implemented into the design. If in doubt as to requirements, contact this office for assistance.

1.9.7 Energy Analysis Narrative

The narrative portion of the energy analysis shall contain a narrative description and analysis for each of the mechanical portions of the design used to simulate the building systems. Energy analysis shall not be limited to mechanical systems, but, shall include building envelope, glazing, shading, electrical systems, as indicated in paragraph ENERGY BUDGET COMPLIANCE (EUB) CHECK in Section 01006. The basis and reasons for specific engineering decisions, special features, unusual requirements, etc., shall be explained or summarized as applicable. If it is necessary to deviate from criteria or standard practice, reasons shall also be included. The total scope projected to final design shall be outlined in a

form that will be conveniently adapted, expanded, and detailed at the final design stage. If alternatives were to be evaluated and selected by the designer, findings (pros and cons) and conclusions shall be included. The design analysis shall carry a complete narrative (including Energy Budget Analysis) for every item and system covered in the design, see section 01006 paragraph ENERGY BUDGET COMPLIANCE (EUB) CHECK and shall include, but not be limited to, the following:

a. Index

Provide a mechanical energy analysis index identifying all main and sub-paragraph headings.

b. Project Summary

Provide a brief description of the mechanical design systems simulated.

c. Applicable Criteria

A list of all applicable criteria used for basis of design.

d. Design Conditions

A list of Mechanical HVAC design conditions including elevation, latitude, heating/cooling degree days, winter and summer outside design temperatures, inside design temperatures for all spaces, ventilation rates, etc. shall be provided.

1.9.8 Life Cycle Cost Analysis (LCCA) (Where Required)

The narrative portion of the life cycle cost analysis shall contain a narrative description and analysis for each of the mechanical portions of the design used required to be compared for LCCA including but not limited to mechanical systems, shading, glazing, lighting, and other features of the building. The basis and reasons for specific engineering decisions, special features, unusual requirements, etc., shall be explained or summarized as applicable. If it is necessary to deviate from criteria or standard practice, reasons shall also be included. The total scope projected to final design shall be outlined in a form that will be conveniently adapted, expanded, and detailed at the final design stage. If alternatives were to be evaluated and selected by the designer, findings (pros and cons) and conclusions shall be included. The design analysis shall carry a complete narrative (including LCCA analysis) for every item and system required, see section 01006 paragraph and shall include, but not be limited to, the following:

a. Index

Provide a life cycle cost analysis index identifying all main and sub-paragraph headings.

b. Project Summary

Provide a brief description of the mechanical design LCCA systems required.

c. Applicable Criteria

A list of all applicable criteria used for basis of design.

1.10 ELECTRICAL

1.10.1 Drawings

Drawing scale shall match architectural drawing requirements. Drawings shall show the following:

1.10.1.1 Lighting Layout and List of Fixtures

Complete lighting layout of all areas shall be provided. The type of fixture shall be indicated on the drawing. Complete list of fixtures proposed with type of lamp and wattage.

1.10.1.2 Receptacle Layout

Complete receptacle layout should be provided for all areas to indicate project requirements.

1.10.1.3 Power Equipment and Layout

Power equipment and layout such as switchgear, panelboards, large motor driven items, etc.

1.10.1.4 Power One Line Diagram

Power one line diagram shall be shown to indicate arrangement of the system.

1.10.1.5 Communications

Communications (telephone, public address) shall be shown sufficiently to indicate the designers understanding of the Section 01007 ELECTRICAL REQUIREMENTS.

1.10.1.6 Fire Detection

Fire Detection drawings shall be provided and inserted in the Fire Protection/Fire Suppression F-Series of drawings.

1.10.1.7 Miscellaneous Details of Special Equipment

Miscellaneous details of special equipment to indicate understanding of 01007 ELECTRICAL REQUIREMENTS.

1.10.2 Specifications

Submit prescriptive specification sections to specify the quality, characteristics, installation procedures and testing requirements for all items of the proposed electrical design.

Specifications shall be provided (to approximately 60 percent completion).

See Section 01332 SUBMITTALS DURING DESIGN, paragraph 3.2, SPECIFICATIONS for additional requirements.

1.10.3 Design Analysis Narrative

The design analysis shall contain a description and analysis of the electrical portions of the design. Special features, unusual requirements, etc., should be noted. Narrative must address all technical requirements

identified in Section 01007 ELECTRICAL REQUIREMENTS.

1.10.4 Design Analysis Calculations

Backup data shall be furnished to support basic design decisions related to sizing of major equipment and materials. As a minimum the following shall be submitted.

1.10.4.1 Service

Sizing of building services EMD (Estimated Maximum Demand) for all the building loads.

1.10.4.2 Transformers

Sizing of general purpose dry type transformers.

1.10.4.3 Feeders

Sizing of main feeders.

1.10.4.4 Panelboards

Sizing of panelboards and distribution equipment.

1.10.4.5 Illumination Calculations

Data should identify target and calculated illumination levels for all typical rooms. Calculations should be adjusted to compensate for special applications such as irregularly shaped rooms, open sides, ceiling obstructions (beams, ductwork), corridors, etc. If the lumen method is used for corridor calculations, the calculations should be performed using a module in which the length doesn't exceed 3 times the width (2:1 ratio preferred).

1.10.4.6 Short Circuit Evaluation

The maximum possible fault current at the building service should be calculated.

1.11 FIRE PROTECTION

1.11.1 DRAWINGS

Features of Fire Protection, their ratings, and the hazards requiring them, shall be clearly indicated. Sprinkler and fire alarm/detection areas shall also be clearly indicated. Fire detection and sprinkler systems shall be laid out and detailed sufficiently to indicate the designers understanding of the Section 01008 FIRE PROTECTION REQUIREMENTS. When other functions co-exist with the fire protection functions, their integration shall be clearly indicated, with an analysis that describes how both functions will be served. Provide a separate, composite type floor plan which makes an accurate presentation of these various features and functions. As part of the submittal, provide a set of plans that shows emergency egress for the facility.

1.11.2 DESIGN ANALYSIS

The design analysis shall include a separate fire protection report

containing, but not limited to, review statements and/or comments on the following items, where applicable.

- a. Location and rating of fire walls and fire partitions.
- b. Column, floor, and roof protection.
- c. Path of travel for emergency egress and operation of panic exits.
- d. Access to building for fire fighting.
- e. Design and placement of fire and smoke stop doors.
- f. Labeled windows, where required.
- g. Venting of smoke.
- h. Placement of hand fire extinguisher cabinets.
- i. Type and adequacy of sprinkler system.
- j. Building exterior fire protection facilities and building clearances.
- k. Type of occupancy.
- l. Zoning of fixed fire protection systems.
- m. Type and adequacy of fire alarm and detection systems.
- n. Zoning of fire alarm and detection systems.
- o. Number of zones of alarm and detection systems that are separately transmitted to the base or installation fire department.
- p. Type of Construction.
- q. Height and area limitation.
- r. Flame-spread and smoke-developed ratings.
- s. Water supplies for fire protection.

1.11.3 TECHNICAL GUIDE SPECIFICATIONS

No guide specifications are required to be submitted at this design stage.

However; any Contractor generated specifications required to meet the project specifics, or individual specification items added to the guide specifications shall be submitted for review. Note that guide specifications 13930a, WET PIPE SPRINKLER SYSTEMS, FIRE PROTECTION and 13851a, FIRE DETECTION AND ALARM SYSTEM, ADDRESSABLE are required to be edited. As such they may be edited only for those portions that do not apply to this project. Note that this applies only to equipment items. Testing, qualifications, submittal requirements, etc., may not be modified or deleted. For the equipment items that do apply, no changes may be made.

1.12 ENVIRONMENTAL PROTECTION, COMPLIANCE, AND PERMITS

1.12.1 General Requirements

Specification Section 01355, ENVIRONMENTAL PROTECTION, furnished with Division 1 of this RFP, contains requirements presently known to be required for environmental protection, compliance, and permits on this project. It is the Contractor's responsibility to provide any additional requirements to ensure that the project is in full environmental compliance with Federal, State, and local laws and regulations. The Contractor shall include any additional requirements in the 60% Environmental Protection, Compliance, and Permits Design Analysis Chapter and the Environmental Protection Plan for the project.

1.12.2 Design Analysis Chapter

The Contractor shall prepare a chapter in the Design Analysis entitled: "ENVIRONMENTAL PROTECTION, COMPLIANCE, AND PERMITS". This chapter shall include a summary of environmental coordination, compliance, approvals, permits, and etc. required for the project. The Contractor shall include documentations of the persons contacted along with phone numbers, summary of coordination, discussions, phone conversation records, and/or letters required to assure that the project is in full compliance with all Federal, State, and local environmental laws and regulations. A list of environmental permits, approvals, notifications, etc. that are required for the project shall be included.

1.12.3 Draft Environmental Protection Plan

The Contractor shall prepare and submit a Draft Environmental Protection Plan in accordance with the requirements of Section 01355 ENVIRONMENTAL PROTECTION. If additional environmental compliance plans are identified during the design, the Contractor shall include the additional plans.

1.12.4 Appendix to the Environmental Protection Plan

As an Appendix to the Draft Environmental Protection Plan, the Contractor shall submit copies of the permit applications and associated documents, notices, reviews, and/or approvals that are required for the project. If at 60% Design any permits or approvals have been received, copies of the permits and/or approvals shall be included.

1.13 SUSTAINABLE DESIGN REQUIREMENTS

Provide a list of planned sustainable design features incorporated into the design of this facility.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

PART 3 - CODE ANALYSIS
UNIFORM BUILDING CODE (UBC) AND NFPA "LIFE SAFETY CODE" ANALYSIS

LIFE SAFETY AND FIRE PROTECTION IS AN INTEGRAL PART OF EVERY FACILITY DESIGN. RECOGNIZED CODES AND ACCEPTED SAFETY STANDARDS SHALL BE FOLLOWED IN THE DESIGN OF ALL FACILITIES. OF THE VARIOUS CODES AND SAFETY STANDARDS THE NATIONAL FIRE PROTECTION ASSOC. (NFPA) "LIFE SAFETY CODE" SHALL TAKE PRECEDENCE. ALL APPLICABLE REQUIREMENTS OF THE LIFE SAFETY CODE SHALL BE INCORPORATED INTO EACH DESIGN. FOR TYPE OF CONSTRUCTION, FIRE AREA LIMITATIONS, AND ALLOWABLE BUILDING HEIGHTS THE DESIGN SHALL FOLLOW THE UNIFORM BUILDING CODE (UBC).

CHECK LIST

PROJECT NAME _____ DATE _____
LOCATION _____

4. UNIFORM BUILDING CODE ANALYSIS

4.1 OCCUPANCY CLASSIFICATION (See Table 5A):

Area: Classification:
(GROUP: _____): Div. _____
(GROUP: _____): Div. _____
(GROUP: _____): Div. _____

PRINCIPAL OCCUPANCY _____

OTHERS (SPECIFY) _____

4.2 TYPE OF CONSTRUCTION : _____

4.3. OCCUPANCY SEPARATION REQUIRED (SEE TABLE 5-B):

_____	TO	_____	=	_____	HRS
_____	TO	_____	=	_____	HRS
_____	TO	_____	=	_____	HRS
_____	TO	_____	=	_____	HRS
_____	TO	_____	=	_____	HRS

4.4 FIRE RESISTANCE OF EXTERIOR WALLS: (SEE TABLE 5-A)

NORTH _____
SOUTH _____
EAST _____
WEST _____
OTHER _____

PART 3 - CODE ANALYSIS

UNIFORM BUILDING CODE (UBC) AND NFPA "LIFE SAFETY CODE" ANALYSIS

4. UNIFORM BUILDING CODE ANALYSIS

4.5 OPENINGS IN EXTERIOR WALLS: (SEE TABLE 5-A)

NORTH _____
SOUTH _____
EAST _____
WEST _____
OTHER _____

4.6 MAX. ALLOWABLE FLOOR AREA (SEE TABLE 5-C):

ALLOWABLE:

IF SPRINKLERED: _____

ALLOW. AREA INCREASES _____

CALCULATED ACTUAL FLOOR AREA:

Floor	Square Footage
-------	----------------

Totals:

4.7 MAX. ALLOWABLE HEIGHT (SEE TABLE 5-D):

FEET: _____

STORIES: _____

Proposed Height of Building:

Actual No. of Stories:

4.8 COMMENTS:

DESIGNER: _____

PART 3 - CODE ANALYSIS

UNIFORM BUILDING CODE (UBC) AND NFPA "LIFE SAFETY CODE" ANALYSIS

5. NFPA 101 "LIFE SAFETY CODE"

5.1 CLASSIFICATION OF OCCUPANCY: _____

HAZARD OF CONTENTS:

LOW _____

ORDINARY _____

HIGH _____

5.2. FIRE RESISTIVE REQUIREMENTS:

EXTERIOR WALLS: _____ HRS _____

INTERIOR WALLS: _____ HRS _____

STRUCTURAL FRAME: _____ HRS _____

VERTICAL OPENINGS: _____ HRS _____

FLOORS: _____ HRS _____

ROOFS: _____ HRS _____

EXTERIOR DOORS: _____ HRS _____

EXTERIOR WINDOWS: _____ HRS _____

BOILER ROOM ENCLOSURE _____ HRS _____

OTHER (LIST) _____ HRS _____

_____ HRS _____

_____ HRS _____

_____ HRS _____

PART 3 - CODE ANALYSIS

UNIFORM BUILDING CODE (UBC) AND NFPA "LIFE SAFETY CODE" ANALYSIS

5. NFPA 101 "LIFE SAFETY CODE"

5.3 MEANS OF EGRESS:

OCCUPANCY LOAD FACTOR: _____

OCCUPANCY	FACTOR	ACTUAL AREA	ACTUAL LOAD
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

5.4 NUMBER OF EXITS REQUIRED: _____

5.5 MINIMUM WIDTH OF EXITS:

CALCULATED: _____

ACTUAL: _____

5.6 MAXIMUM ALLOWABLE TRAVEL DISTANCE TO EXIT: _____

WITH SPRINKLERS: _____

5.7 EXIT DOORS:

MINIMUM WIDTH ALLOWED: _____

MAXIMUM LEAF WIDTH ALLOWED: _____

WIDTH REQUIRED FOR NO.OF OCCUPANTS: _____

PART 3 - CODE ANALYSIS

UNIFORM BUILDING CODE (UBC) AND NFPA "LIFE SAFETY CODE" ANALYSIS

5. NFPA 101 "LIFE SAFETY CODE"

5.8 EXIT CORRIDORS:

MAX. COMMON PATH OF TRAVEL: _____
MINIMUM ALLOWABLE WIDTH: _____
REQUIRED TO HAVE EXIT AT EACH END OF CORRIDOR? ____

DEAD END CORRIDORS ALLOWED? _____
MAXIMUM LENGTH: _____
WALL FIRE RESISTANCE REQUIRED: _____

DOORS & FRAME FIRE RESISTANCE REQUIRED: _____

5.9 STAIRS:

MINIMUM WIDTH _____ FOR OCCUP. LOAD OF _____
MINIMUM WIDTH _____ FOR OCCUP. LOAD OF _____
MINIMUM WIDTH _____ FOR OCCUP. LOAD OF _____
MINIMUM WIDTH _____ FOR OCCUP. LOAD OF _____

MAX. RISER ALLOWED: _____
MINIMUM TREAD ALLOWED: _____

LANDINGS:

MIN. SIZE: _____
MAX. VERTICAL DIST. BETWEEN LANDINGS: _____

REQUIRED HEIGHT OF RAILINGS: _____

HANDRAILS:

REQUIRED AT EACH SIDE? _____
INTERMEDIATE RAIL REQUIRED? _____
HEIGHT ABOVE NOSING _____
INTERMEDIATE RAIL REQUIRED? _____
MAX. SPACE ALLOWED BETWEEN RAILS: _____

STAIR ENCLOSURE REQUIRED? _____

STAIR TO ROOF REQUIRED? _____

STAIR TO BASEMENT REQUIRED? _____

5.10 HATCHWAY ACCESS TO ROOF REQUIRED? _____

PART 3 - CODE ANALYSIS

UNIFORM BUILDING CODE (UBC) AND NFPA "LIFE SAFETY CODE" ANALYSIS

5. NFPA 101 "LIFE SAFETY CODE"

5.11 LADDER ACCESS TO ROOF REQUIRED? _____

5.12 HORIZONTAL EXIT REQUIREMENTS: _____

5.13 PROTECTION OF OPENINGS NEAR EXTERIOR STAIR EXIT DOORS:

5.14 SMOKEPROOF ENCLOSURE REQUIRED: _____

5.15 RAMPS:

MAX. SLOPE TO USE AS EXIT _____

HANDRAILS REQUIRED? _____

5.16 COMMENTS:

DESIGNER: _____

FOLLOWING IS A LIST OF ADDITIONAL "NFPA" CODES THAT ARE COMMONLY USED.
INDICATE WHICH OF THESE CODES ARE USED AND ADD THOSE REQUIREMENTS TO THIS
ANALYSIS.

MIL HDBK- FIRE PROTECTION FOR FACILITIES, ENGR,
1008C DESIGN AND CONSTRUCTION.
NFPA 10 FIRE EXTINGUISHERS, PORTABLE
NFPA 80 FIRE DOORS AND WINDOWS

ATTACHMENT NO. 2
 ADA ARCHITECTURAL DESIGN CHECKLIST
 Project Name: _____
 Project Location: _____
 Design Phase: _____

ITEM NO.	INCORP LATER	INCORP	N/A
1. Established with the Base/owner of the facility the for handicap accessibility.	_____	_____	_____
2. Received a waiver for no handicap accessibility requirements on the facility.	_____	_____	_____
3. Facility is designed utilizing:			
New Construction Criteria	_____	_____	_____
Building Alteration Criteria	_____	_____	_____
Historic Building Preservation Criteria:	_____	_____	_____
4. Accessible Route (egress/corridors/halls/aisles).			
- Provided minimum fire egress routes.	_____	_____	_____
- Provided minimum site accessible routes.	_____	_____	_____
- Provided proper clearance widths.	_____	_____	_____
- Provided proper floor level changes.	_____	_____	_____
- Provided proper floor materials.	_____	_____	_____
- Provided protection from protruding objects.	_____	_____	_____

ITEM NO.	INCORP LATER	INCORP	N/A
5. Ramps:			
- Maximum slopes less than 1:12	_____	_____	_____
- Maximum run less than 9144mm for 1:12 slopes 12,192mm for 1:16 slopes	_____	_____	_____
- Minimum clear width exceeds 914mm.	_____	_____	_____
- Provided proper edge protection.	_____	_____	_____
- Provided handrails of proper configuration and diameter.	_____	_____	_____
- Provided proper handrail extensions at top and bottom of ramp.	_____	_____	_____
- Provided handrails at proper mounting heights.	_____	_____	_____
- Provided proper landings.	_____	_____	_____
- Provided proper cross slope on ramp surface.	_____	_____	_____
6. Stairs:			
- Protected the space below stairs from access by the blind.	_____	_____	_____
- Provided handrails of proper configuration and diameter.	_____	_____	_____
- Provided proper handrail extensions at top and bottom of stairs.	_____	_____	_____
- Provided handrails at proper mounting heights.	_____	_____	_____
- Provided treads greater than 279mm in width.	_____	_____	_____
- Provided proper nosings.	_____	_____	_____
7. Elevators:			
- Provided buttons and lanterns at the proper mounting height.	_____	_____	_____
- Provided Braille characters.	_____	_____	_____
- Provided proper door widths.	_____	_____	_____
- Provided proper clearance inside elevator car.	_____	_____	_____

ITEM
NO.

INCORP INCORP N/A
LATER

8. Doors And Hardware:

- Provided proper door widths.
- Provided proper clearance on both sides of jambs.
- Entrance vestibules provided with adequate clearances.
- Provided levers on locksets and exit hardware.
- Provided closers with mechanical adjustments.
- Provided accessible thresholds.
- Provided protection plates on doors heavily used by wheel chair bound people.

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

9. Toilet Facilities:

- Provided proper floor clearance through out the toilet rooms.
- Provided minimum number of required accessible fixtures.
- Provided accessible toilet stalls.
- Provided stall doors with correct direction of swing.
- Provided accessible water closets.
- Provided grab bars at accessible water closets.
- Provided grab bars with correct configuration and dimension.
- Provided accessible sinks/lavatories.
- Provided accessible urinals.
- Provided accessible water coolers and fountains.
- Provided accessible mirrors.
- Provided accessible toilet accessories at required locations.
- Provided all fixtures and accessories at proper mounting heights and clearances.
- Provided insulated or protected exposed pipes at lavatories.

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

10. Shower/Tub Facilities:

- Provided the minimum number of accessible showers/tubs.
- Provided showers/tubs with grab bars.
- Provided showers/tubs with seats as required.
- Provided controls mounted at the proper height and location.
- Provided proper clearances and dimensions in showers/tubs.
- Provided proper floor clearance through out shower/tubs rooms.
- Provided doors with correct direction of swing and clearance.

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

ITEM NO.	INCORP LATER	INCORP	N/A
11. Storage:			
- Provided accessible cabinets, shelves, closets, and drawers as required.	_____	_____	_____
- Provided proper clearance, mounting heights, and reach provisions.	_____	_____	_____
12. Telephones and Vending:			
- Provided the minimum number of required accessible public telephones.	_____	_____	_____
- Provided proper floor clearance around telephone.	_____	_____	_____
- Phone and controls mounted at proper heights and within reach.	_____	_____	_____
- Provided vending machines on an accessible route.	_____	_____	_____
- Provided vending machines with accessible clearances and protruding object safe guards.	_____	_____	_____
13. Fixed Or Built-in Seating And Tables:			
- Provided the minimum number of accommodations for accessibility in areas which required fixed furniture.	_____	_____	_____
- Provided proper floor clearance around furniture.	_____	_____	_____
- Provide proper knee space at tables.	_____	_____	_____
- Provided tables and counters with proper top surface heights.	_____	_____	_____
14. Assembly Areas:			
- Provided the minimum number of accessible seating spaces.	_____	_____	_____
- Provided seating which is easily accessible to emergency egress.	_____	_____	_____
- Provided companion seating.	_____	_____	_____
- Integrated and dispersed accessible seating with the rest of the seating.	_____	_____	_____
- Provided accessible dressing rooms.	_____	_____	_____
- Provided level floor surface at accessible seat locations.	_____	_____	_____
- Provided clear ground or floor space at accessible seat locations	_____	_____	_____
- Provided access to all performing areas and associated spaces.	_____	_____	_____

ITEM
NO.

INCORP INCORP N/A
LATER

15. Dining Halls And Cafeterias:

- Provided the minimum number of accessible dining spaces.
- Provided accessible counters and bars.
- Provided accessible aisles between tables or walls.
- Provided clear floor space at accessible dining locations.
- Provided accessible food service lines meeting minimum clearances and reaches.
- Provided accessible tableware and condiment areas.
- Provided raised speaker platform with protected edges.

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

16. Medical Care Facilities:

- At least 10% of the general patient rooms are accessible.
- Provided the number of accessible patient rooms as required for specialized treatment, long term care, or alterations of existing patient rooms.
- Provided at least one accessible entrance with weather protecting canopy or roof overhang.
- Provided minimum clearances within the patient rooms and around the beds.
- Provided accessible patient toilet/bath rooms.

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

17. Business And Mercantile:

- Provided at least one accessible sales counter, services counter, teller, information window, etc.
- Security bollards when provided, do not prevent access or egress to people in wheel chairs.

_____	_____	_____
_____	_____	_____

ITEM NO.	INCORP LATER	INCORP	N/A
18. Libraries:			
- Provided access to all reading and stack areas, reference reference rooms, reserve areas, and special facilities or collections.	_____	_____	_____
- Provided at least 5% or a minimum of one of each element or fixed seating, tables, or study carrels as accessible.	_____	_____	_____
- Provided at least one lane of check out areas as accessible.	_____	_____	_____
- Provided adequate clearance and reach distances at card catalogs and magazine displays.	_____	_____	_____
- Provide stacks with minimum clear aisle width.	_____	_____	_____
19. Temporary Lodging:			
- All common and public use areas are accessible.	_____	_____	_____
- Provided accessible units, sleeping rooms, and suites.	_____	_____	_____
- Provided sleeping accommodations for persons with hearing impairments.	_____	_____	_____
- Provided a dispersed class and a range of room options.	_____	_____	_____
- Provided accessible rooms in ADAL projects.	_____	_____	_____
- Provided an accessible route to accessible sleeping rooms.	_____	_____	_____
- Provided accessible clearance widths within sleeping rooms and around beds.	_____	_____	_____
- Provided accessible doors within accessible sleeping rooms.	_____	_____	_____
- Provided accessible fixed or built-in furniture and storage units.	_____	_____	_____
- Provided accessible controls throughout accessible units.	_____	_____	_____
- Where provided as part of an accessible unit each of the following were provided as accessible: living area, dining area, at least one sleeping area, patio/terrace/ balcony, toilet/bath, and carport/garage/parking.	_____	_____	_____
- Where provided as apart of an accessible unit, the kitchen, kitchenettes, wet bars, or similar amenities were also provided with accessible features.	_____	_____	_____
- Provided visual alarms, notification devices, and accessible telephones.	_____	_____	_____
- Provided accessible doors and doorways designed to allow passage into and within all sleeping units or other covered units.	_____	_____	_____

20. Transportation Facilities:

(This section covers Air, Rail, and Bus public transportation facilities. See Section 10 of the ADA Guide for specific requirements for these facilities)

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SECTION 01338

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SECTION 01338

100 PERCENT DESIGN REQUIREMENTS

PART 1 100 PERCENT DESIGN SUBMITTALS

For general submittal requirements, see Section 01332 SUBMITTALS DURING DESIGN.

1.1 SITE PLANNING

1.1.1 Drawings. All drawings shall be completely dimensioned in metric units, labeled, and noted. All approved comments from the 60 Percent Design Submittal shall have been incorporated. Cross-reference applicable sheets for items shown. Drawings required:

1.1.1.1 Location Plan and Vicinity Map

1.1.1.2 Removal Plan

1.1.1.3 Site Plan

1.1.1.4 Site Details

1.1.1.5 Landscape Plan

1.1.1.6 Landscape Details

1.1.1.7 Irrigation Plan

The contractor shall supply an Irrigation System Plan at the same metric scale as the Landscape Plan showing the landscape plan with the proposed turf and plant locations and the completely designed irrigation system with all necessary components and lines with their material types and sizes shown and delineated. All section valves shall be numbered and have the correct gallonage and pressure at which they operate.

1.1.1.8 Irrigation Details

Details of the irrigation equipment and system including valves, couplers, sprinkler heads, controllers, precipitation rates, pipe material, and total flow and pressure requirements.

1.1.2 Specifications

a. Provide complete edited specifications for all items. Technical specifications shall be complete and fully coordinated with the drawings. All specification indexes shall be completely edited to reflect the paragraphs retained in the body of the specification. All references that have not been used in the body of the specification shall be edited from the technical specification.

b. Specifications shall be coordinated with the plans and include all items including seeding, sodding, trees and shrubs, lawn and plant irrigation, and exterior furnishings. Special sections shall be prepared to cover those subjects for which no pattern guide specifications are available. All UFGS or designated CEGS guide

specifications, to be provided, shall be in edited form showing all text to be deleted and added.

1.1.1.3 Design Analysis Narrative

Design analysis shall include the following:

1.1.1.3.1 References

Provide design references used in preparing the site design.

1.1.1.3.2 Basis For Design

The Design Analysis should give the basis, specific goals, objectives and priorities for site design of the project. Identify, explain and document use of design criteria and how the design meets goals, objectives and priorities. Identify the preferred site development concept. Document pollution prevention measures and other environmental considerations made during the design process.

1.1.1.3.3 Irrigation System Calculations

A list of applicable criteria and/or design standards shall be provided. This shall include precipitation rates, allowable pipe material and calculations of total flow and pressure requirements. Include a narrative description of the system and list any special requirements and/or systems.

1.2 CIVIL

1.2.1 Drawings

1.2.1.1 Grading and Drainage Plan

A final grading and drainage plan shall be provided at the same scale as the site plan. New and existing grading contours shall be indicated at 1 foot contour intervals. Indicate the finished floor elevation of all new and existing buildings. Plans shall show the layout of the new and existing storm drainage systems. Uniform grades shall be labeled using slope arrows. Provide spot elevations at building corners, parking area corners, changes in grade, etc. Storm drainage lines and structures shall be labeled. The rim elevation of all manholes, curb inlets, and area inlets shall be indicated.

1.2.1.2 Storm Water Pollution Prevention Plan (SWPPP) Site Map

Provide a site map indicating drainage patterns and approximate slopes anticipated after major grading activities, areas of soil disturbance, areas which will not be disturbed, locations of major structural and nonstructural erosion controls identified in the SWPPP, locations where stabilization practices are expected to occur, locations of off-site material, waste, borrow or equipment storage areas, surface waters (including wetlands), and locations where storm water discharges to a surface water.

1.2.1.3 Grading Sections

The preliminary grading sections provided at 60% shall be revised as necessary.

1.2.1.4 Storm Drain, Roof drain, and Culvert Profiles

Provide profiles of all new storm drains and culverts showing new and existing grades, new and existing utilities, pavement sections in detail, pipe diameters and lengths, pipe slopes, invert elevations, etc. Class and gauge of all storm drain, roof drain, and culvert pipes shall be provided. Profiles of roof drain runoff lines may or may not be provided, at the Contractor's discretion. However, invert elevations, lengths and pipe diameters of these roof drains shall be called out on the drawings.

1.2.1.5 Drainage Structure Details

Provide typical details of all storm drainage structures. Unless otherwise directed, use Omaha District standard detail drawings. The use of alternate details shall be approved prior to submitting the final design documents. A, B, C, and D dimensions of all storm drain and subdrain structures shall be shown. Dimensions may be shown on either the storm drain schedule, the storm drain profiles, or on the storm drain structure detail drawings.

1.2.1.6 Pavement Details

Provide details of concrete curb and gutter, integral curb, typical pavement sections, typical sidewalk section, pavement utility cut details, and interface detail between new and existing pavement.

1.2.1.7 Pavement Joint Layout Plans

Provide pavement joint layout plans with spot elevations at joint intersections for all new concrete pavements. Each type of joint shall be shown with a different symbol and a joint legend provided. Pavement joint layout plans shall be drawn at a scale of 1/8-inch or 1/16-inch = 1 foot. Under no circumstances shall pavement joint layout plan be combined with any other plans.

1.2.1.8 Concrete Pavement Joint Details

Provide concrete pavement joint details. Use Omaha District standard detail drawings.

1.2.1.9 Erosion Control Details

Provide details of best management practices used to control erosion.

1.2.2 Specifications

Provide complete edited specifications for all items. Technical specifications shall be complete and fully coordinated with the drawings. All specification indexes shall be completely edited to reflect the paragraphs retained in the body of the specification. All references that have not been used in the body of the specification shall be edited from the technical specification.

1.2.3 Design Analysis Narrative

Design analysis shall include the following:

1.2.3.1 References

Provide design references used in preparing the civil design.

1.2.3.2 Grading

A narrative of the grading design and criteria used.

1.2.3.3 Drainage

A narrative of the drainage design and criteria used. Include information on the storm drain pipe materials selected and their ability to withstand earth dead loads and live loads that will be imposed.

1.2.3.4 Pavements

A narrative of the pavement design and criteria used.

1.2.4 Design Analysis Calculations

1.2.4.1 Storm Drainage System Calculations

Storm Drainage System Calculations shall include the following:

- a. Drainage area map showing boundaries of each drainage area and respective drain inlet or culvert.
- b. Storm run-off calculations for each drainage area.
- c. Tabulation of capacities of new storm drains including: diameter and slope of storm drain pipes, design storm discharge and velocity for each storm drain pipe, maximum discharge capacity of each storm drain pipe, headwater depth of each culvert during design storm discharge.
- d. Hydraulic capacity calculations for each new curb and area inlet.

1.2.4.2 Pavement Design Calculations

Calculations used to obtain the pavement design.

1.2.5 Storm Water Pollution Prevention Plan (SWPPP)

The Contractor shall prepare the SWPPP in accordance with Omaha District guide specification Section 01565 NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITE and the EPA Storm Water General Permit For Construction Activities (Permit No. COR10*##F). The SWPPP shall be subject to approval by the Government.

1.3 GEOTECHNICAL

1.3.1 Drawings

1.3.1.1 Boring Location Plan

A boring location plan shall be provided. The boring location plan shall be at the same scale used for the Site Plan. A copy of the boring location plan issued with this Request for Proposal (RFP) is part of the Final Foundation Analysis (Attachment No. 2).

1.3.1.2 Boring Log Sheet

Boring logs shall be provided on a separate sheet of the drawings. A copy of the boring logs issued with the RFP is part of the Final Foundation Analysis (Attachment No. 2).

1.3.2 Design Analysis

A copy of the Final Foundation Analysis (Attachment No. 2) shall be included as an appendix to the Design Analysis.

1.4 WATER SUPPLY AND WASTEWATER

1.4.1 Drawings

Generally, the corrected and approved 60 percent plans may be used as the basis for the final plans. However, all details necessary for complete construction must be included. The 100 percent final design submittal shall include all the information presented in the 60 percent submittal, updated to final design status, corrected to reflect any changes made in response to review comments, and shall include the additional requirements specified hereinafter. Any concerns in developing the final design documents shall be resolved prior to starting the final design stage.

1.4.1.1 Water Distribution and Sewage Collection Systems Plans (including building services)

Provide all existing utilities and above ground features, including sizes and material types, which may pose as an obstacle (i.e., water, sewer, gas, electrical, etc.) on the basic site plan layout. Indicate existing pipe material and sizes where new lines connect along with the type of connection and elevations of connections. Provide all new water and sewer lines with sizes. This will include all new service lines, up to within the 1.5 meter building line. Locations of all new manholes, fire hydrants, valves (including PIV's), similar appurtenances, and connection points shall be provided. Show contours on plan view. Include stationing on both plan and profile sheets.

1.4.1.2 Water Distribution and Sewage Collection Systems Profiles

Profiles of all gravity sewers and waterlines shall be provided. Profiles may be omitted for short waterlines, unless necessary to assure adequate cover or avoid interference with other underground facilities. Indicate existing pipe material and sizes where new lines connect. Indicate type of connection and elevation. Include all interference elevations.

1.4.1.3 Water Distribution and Sewage Collection Systems Details

Appropriate water and sewer details shall be provided. Use Omaha District standard detail drawings. The standard detail sheets will be furnished if required. For roadway pavement crossings, indicate installation method (open cut, boring, jacking, etc.). Include standard casing details.

1.4.2 Specifications

Specifications shall be coordinated with the plans and include all items. Provide special sections to cover those subjects for which no UFGS guide specifications are used or available. These special sections shall include all approved changes from the 60 percent review stage. All UFGS guide

specifications, to be provided, shall be in edited form showing all text to be deleted and added.

1.4.3 Design Analysis Narrative

Design analysis shall include the following and all applicable data contained in the 60 percent design analysis narrative shall be repeated. References shall not be made to the previous design analysis. The final design analysis shall be corrected to reflect changes in content made in response to review comments, and shall be expanded to reflect the completed design.

1.4.3.1 References

Provide design references used in preparing the water and wastewater design.

1.4.3.2 Water Supply and Distribution Systems

A narrative of the water supply and distribution systems design and applicable criteria used shall be provided. Include the peak and average domestic demands, the interior and exterior fire flow requirements and the available flow and residual pressures. A description of the water distribution system, and complete calculations necessary to support equipment, piping sizes, interior and exterior fire demands, and domestic demands, etc. shall be provided.

1.4.3.3 Wastewater and Sewers

A narrative of the wastewater supply design and applicable criteria used shall be provided. Include the average and peak contributing flows along with the available capacity and full flow capacity of the existing system. A listing of allowable piping materials, and complete calculations necessary to support equipment and piping sizes shall be provided.

1.5 ARCHITECTURAL

1.5.1 Drawings

The drawings shall be complete, include all necessary and required details, thoroughly checked, and fully coordinated with the technical Specifications and all other Construction Documents. Previous comments and applicable criteria changes shall have been incorporated into the design. The contract drawings shall fully describe the type and the scope of work required. The layout of individual sheets and the organization of the assembled set shall follow and communicate a logical sequence. General information shall be presented first, progressing to more detailed information. When assembling details, begin in the upper left-hand corner of the sheet with letters progressing to the right and down. When dimensioning, use arrowheads, not dots or slashes. Where major structural elements are included as parts of architectural detailing, do not indicate sizes. These elements must be fully defined in the structural design documents. See 60% Architectural drawing submittal requirements for drawing scales of remaining drawings to be submitted. Include all drawings from the 60% submittal plus all additional detail drawings required for complete 100% design. These shall include but not be limited to the following:

Interior Elevations and Details
Door Details

- Window Details
- Louver Details
- Roof Details
- Stair Details
- Casework Plans, Elevations, and Details
- Wall Plan Details and Plan Details
- Fire Wall Details and Penetration Conditions
- Sealant Details
- Ceramic Tile Details
- Ceiling Details
- Control/Expansion Joint Details
- All Miscellaneous Details
- All Floor & Wall Patterns/Borders

1.5.1.1 Color Rendering

At this phase, the Contractor shall provide the chosen sketch as an artist rendering of the completed facility with walks, parking, vehicles, landscaping, fencing, and other surrounding features. The overall framed size shall be approximately 762 mm x 910 mm (30 inches x 36 inches), multi-colored, not computer generated. The rendering shall be an accurate and realistic representation of the form, massing, scale, and color of the actual design. Rendering shall be done in an opaque water color.

1.5.1.2 Framed Rendering

After approving the completed color rendering above, the Contractor shall submit at the 100% corrected design phase One (1) original and four (4) copies framed. Renderings shall be matted with #789, Granite mat board by Brainbridge or a matching color by another manufacturer. A double matting shall be provided with the interior mat a black, 4.7 mm - 6.4 mm (3/16-inch to 1/4-inch) exposure width.

Glazing shall be sheet plastic at least a minimum 3.2 mm (1/8-inch) thick. Frames are to be metal, flat black, 1-inch deep (wall to face) and with a 4.7 mm - 6.4 mm (1/4-inch to 3/16-inch) face width, depending upon the rendering size. The frame material can be obtained from Nielson Frames, but other manufacturers of the same profile and color are acceptable. Install adjustable devices and picture wire for hanging.

The name of the project, Corps of Engineers- Omaha District, the design firm, and the HQ AFSPC project manager are to be engraved or otherwise professionally applied to a small, black, metal or plastic plate adhered to the exterior of the glazing near the bottom center.

1.5.2 Technical Specifications

The technical specifications shall be complete and fully coordinated with the drawings. Special sections shall be prepared to cover those subjects for which no pattern guide specification is available. Notes to the Designer that accompany specifications shall be used in editing technical guide specifications. All specification indexes shall be completely edited to reflect the paragraphs retained in the body of the specification. All UFGS guide specifications shall be edited in accordance with Section 01332 SUBMITTALS DURING DESIGN.

1.5.3 Design Analysis Narrative

The Design Analysis shall include the basic information presented in the

previous submittal, corrected to reflect changes in content made in response to review comments. Outline specifications shall be omitted from the Final Design Analysis as the information is included on the final drawings and project specifications. The design analysis shall be written in the present tense.

1.5.4 Design Analysis Calculations

The Design Analysis calculations shall include the basic information presented in the previous submittal, corrected to reflect changes in content made in response to review comments.

1.5.5 Common Deficiencies

Some repeated errors have occurred in the preparation of design documents in the past. Subsequently these errors have been identified and the Contractor directed to make corrections. The work involved in such corrections becomes lost effort and time for the designer. Some of these errors which are most often overlooked include:

- a. Not using correct abbreviations or terminology on the drawings. Abbreviations must match what is used on the standard abbreviation sheet and terminology must match what is used in the standard technical guide specifications.
- b. Not using the correct scales, north arrow designation, section cut system, or incomplete dimensioning on the drawings.
- c. Not providing sufficient space for door operation hardware at doors which swing into a wall running perpendicular to the opening. A 4-inch minimum is required between edge of door frame and perpendicular walls.
- d. Not providing correct and complete Design Analysis information written in the present tense. The Design Analysis will be written following the format indicated herein. A separate Fire Protection section in the Design Analysis with input from all disciplines is one area which is often overlooked and shall be included.
- e. Not providing a structural stoop at exterior doors where the slab is at the same approximate elevation as the interior floor. The use of simple slabs on exterior grade leads to lifting of the slab in below-freezing temperatures which interferes with the safe operation of the door.
- f. Not correctly presenting or coordinating (to avoid interference) features of Fire Protection, Noise Control, and Physical Security.
- g. Not correctly referencing and cross referencing building sections, wall sections, details, etc.
- h. Failure to read/use technical notes in editing the Technical Guide Specifications.
- i. Failure to coordinate all disciplines prior to submittal of projects for review.
- j. Improper use of fire-retardant wood. Fire-retardant wood is

combustible; its use in buildings that are of noncombustible construction is extremely limited (see UBC for the minor allowable uses). Because of the potential for severe degradation, fire retardant plywood shall not be used in a roof or roofing system, or in structural applications.

k. Incorrectly listing trade names in door hardware specifications in lieu of ANSI numbers and failure to correctly specify hardware finishes.

l. Control joints in CMU walls and brick expansion joints in face brick are not shown on both architectural plans, elevations and structural plans, or are inconsistent. Note also control joint locating and coordination for floor tile per Tile Council of America recommendations.

m. Failure to delete all publications which do not apply to the particular project.

n. North is not oriented the same direction on all sheets (civil, site, arch).

1.6 INTERIORS

1.6.1 DESIGN ANALYSIS/NARRATIVE

Updates as a result of the 60% review conference shall be made to the design analysis.

1.6.2 TECHNICAL SPECIFICATIONS

Technical specifications shall be in final form for construction (in accordance with the requirements of Section 01332 SUBMITTALS DURING DESIGN) and shall include all changes requested during the 60% review stage. All specifications shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product, installation requirements, and testing methods for this facility.

1.6.3 COLOR BOARDS AND LEGENDS

Color boards shall show actual color samples of all proposed exterior and interior finishes, specialties, and prewired workstations. A color board legend shall accompany the boards and shall clearly identify all finishes. Clarification of finish placement shall be required when more than one color of a single finish is proposed. Color boards shall be 8 1/2" x 11" in size and be provided in a three ring binder. Include project name and location, design stage and date on the front cover and spine of the binder.

1.7 FURNITURE FOOTPRINT

A revised furniture footprint shall be provided. As with the 60% submittal, provide a CD, 100MB ZIP disk or 3.5" floppy of the following revised drawings:

- interior design furniture footprint
- architectural composite and area floor plans, and reflected ceiling plans
- electrical lighting, thermostat, power and communication drawings

Drawings shall be provided in AutoCadd (verify at time with Corps which

version is required.) All reference files and customization shall be included.

1.8 STRUCTURAL

1.8.1 DRAWINGS

Final drawings shall be complete, thoroughly checked, and fully coordinated with the other disciplines, specifications and all other construction documents. Previous comments and applicable criteria changes shall have been incorporated into the design. The drawings shall be complete with all plan views, elevations, sections, details, schedules, diagrams, and notes necessary for the construction of the project. For structural steel framing, the drawings shall meet the requirements for design drawings set forth in the AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings. All structural steel members and connections shall be fully detailed. Design of structural steel connections shall be the responsibility of the structural design engineer and shall not be delegated to the steel fabricator. For structural concrete, the drawings shall conform to the standards for engineering (design) drawings set forth in the ACI Detailing Manual-1988 (SP-66). Additionally, those items described below which are applicable to the design shall be incorporated into the drawings. Drawings shall be at a scale appropriate for the design, in no case however, shall plan type drawings be done at a scale smaller than 1/8-inch = 1 foot or detail type drawings at scale smaller than 1/2-inch = 1 foot.

1.8.1.1 Grid Systems, Dimensions, and Floor Elevations

Each foundation and slab plan, floor framing plan and roof framing plan shall have an alpha-numeric grid system aligned with any columns or pilasters, or with load bearing and non-load bearing walls, as applicable. The same grid system shall be used for all plan views. Each plan view shown shall have all necessary dimensions. On plan views, the dimensions shall define the location of grid lines, offsets, and all structural elements, as well as the overall sizes of the structure. The finish elevation of the ground floor slab shall be indicated as 100, and elevations for all other structural elements shall be numerically referenced to this basic elevation.

1.8.1.2 Plan Sheets

a. Foundation and Slab Plans

Foundation and slab plans shall show the size and location of all foundation elements, such as foundation walls and footings. Elevations for footings shall be indicated on the plan. Plans for slabs-on-grade and exterior stoop slabs at building entrances shall show location and type of joints, slab thicknesses and reinforcing, elevation of slab surfaces, and any other design features, such as equipment bases and areas of depressed slab surface, which affect the slab design. Also, indicate that slabs are placed over vapor barrier and capillary water barrier.

b. Roof Framing Plans

Roof framing plans shall be provided for all parts of the structure. Plans shall show the size, spacing, and location of all roof framing members, their supporting columns, pilasters or walls, all auxiliary members such as bracing and bridging, orientation and extent of coverage of structural roof

deck materials, and the size, location, and framing of all major openings through the roof.

1.8.1.3 Elevation Views, Sections and Details Sheets

Elevation views, sections and details necessary to illustrate fully the design shall be provided. Some requirements peculiar to the various structural materials are described below.

a. Concrete

Include elevation views as necessary, plus sections and details to show the outlines of concrete cross-sections, reinforcing bar arrangements, concrete cover for rebar, installation of embedded items, and joint construction. All lap splice and embedment lengths for reinforcing bars shall be clearly indicated on the drawings. A sill detail for each foundation condition at exterior and interior doors shall be provided.

b. Masonry

Wall reinforcing shall be located and identified on plans, in section cuts, elevation views or in schedules. Structural elevations when needed shall be included to clarify the construction requirements for masonry reinforcement, especially the reinforcement around wall openings. Details applicable to the project shall be shown on the structural drawings. Listed below are some frequently required masonry details, most of which are shown in Army Corps of Engineers TI 809-04, Air Force Technical Manual AFM 88-3, Chap. 3, and on the Typical Masonry Sheets. The Typical Masonry Sheets will be provided to the successful offeror upon request and may be edited and incorporated into the final drawings as needed. Additional details as required shall be extracted from other sources and incorporated into the final drawings. All details shall be fully edited to reflect the specific requirements of this project. Supplemental details shall be added as necessary to complete the design.

Masonry Details Frequently Used

- Masonry Control Joint (MCJ).
- Control Joint at Bond Beam.
- Bond Beam Corner Reinforcement.
- Seismic Reinforcement Around Wall Openings.
- Wall Reinforcement Details for 1 and/or 2 bar-per-cell stiffeners.
- Doweled or Other Connection of Masonry to Foundation, Floor, Roof or Bond Beam.
- Bond Beam (or Steel) Lintels and Bearing Details
- Lateral Support Detail for Top of Masonry Partition Walls.
(lateral support locations must be shown on framing plan sheets.)

c. Structural Steel, Steel Joists, and Steel Decking

Structural steel connections shall be fully detailed and shown on the drawings. The anchorage of beams, trusses, joists, and steel deck to walls or other bearings, and the extra framing or reinforcement required at deck openings shall also be detailed. Notes, details, or schedules on the drawings shall indicate the steel deck attachment method to be used, and shall give the size and spacing for perimeter, side lap, intermediate supports and end lap attachments. Welded connections shall be detailed using standard weld symbols illustrated in AWS D1.1. All applicable weld sizes, spacing, types, contours and finishes shall be shown.

1.8.1.4 Schedules

a. Foundation Schedules

Foundation schedules for footings shall be included, as applicable. The schedule shall include all pertinent information required for the foundation system being used.

b. Framing Schedules

For concrete framing, beam and column schedules shall conform to the requirements of the ACI Detailing Manual. For structural steel framing, provide a column schedule complete with column base plates and design loads at splices, if any, and at column bases.

1.8.1.5 Equipment Loads

All equipment loads which exceed [200 lbs]44N and are not supported by concrete slab-on-grade shall be identified on the drawings by showing equipment locations, total weights, and reaction loads at support points.

1.8.1.6 Notes

a. Design Notes

Under the heading "Designer's Notes," the structural drawings shall contain notes which begin: "The structural design was prepared using the following data:". The data then listed shall include the structural loading criteria used for design, such as roof and floor live loads, snow load design parameters, wind speed and wind load design parameters, seismic design parameters, allowable soil bearing pressures (as recommended by the Final Foundation Analysis), foundation design depth, design wind uplift pressures for steel joists and other data pertinent to future alterations. Also, to be listed are the ASTM designations and stress grades of the applicable structural materials: steel, masonry, concrete for each usage, reinforcing bars, welds, and bolts.

b. General Notes

Other notes, which direct the work to be performed, the materials to be used, etc., shall be grouped under the heading of "General Notes." Included in these notes should be a description of the building's structural system, if necessary.

1.8.2 SPECIFICATIONS

Technical specifications for final design shall be prepared in accordance with the instructions provided in Section 01332 SUBMITTALS DURING DESIGN, Paragraph 3.2 "Specifications". The technical specifications shall be complete and fully coordinated with the drawings. All specification indexes shall be completely edited to reflect the paragraphs retained in the body of the specification. All references that have not been used in the body of the specification shall be edited from the technical specification.

1.8.3 DESIGN ANALYSIS NARRATIVE

The final design analysis narrative shall repeat and expand upon the basic

information presented in the 60% design analysis narrative, and shall be corrected to reflect revisions made for the final design.

1.8.4 DESIGN ANALYSIS CALCULATIONS

Calculations shall be prepared by an experienced structural engineer and shall include an investigation of loading, (gravity, wind, seismic, etc.) shear, moment, wind uplift, stability and deflection calculations. The computations are to be systematic and accurate. Similar beams, columns, panels, or connections may be grouped by designing the largest member or connection in the group, but every individual slab, beam, column, footing, connection or other structural member or structural consideration indicated by the plans shall be accounted for by pertinent calculations, statement or reasoning, or reference to source. Design formulas shall be written out in symbols the first time each is used, before the numerical values are supplied. All answers shall be identified by dimensional units. Basic assumptions of loads, working stresses, and methods of analysis must appear in the calculations; these assumptions must be applied consistently to a given problem. The calculations shall be presented in a clear and legible form, incorporating a title page, table of contents, and a tabulation showing all design loads and conditions. Pages shall be numbered consecutively and identified in the table of contents. Cross referencing shall be clear. The source of loading conditions, formulas, and references will be identified. Assumptions and conclusions will be explained. Superseded areas of computations must be ruled out. All computations shall be given a complete numerical and theoretical check within the Contractor's office. Calculation sheets shall carry the names or initials of the developer and the checker, and the dates of calculations and checking. No portion of the design calculations shall be developed and checked by the same individual.

1.8.4.1 Computer Calculation Submittals

All applicable input and output data shall be included in readable printed form as part of the design calculations. Continuous paper such as that used in computer terminals or printers shall be cut into individual pages and shall not be submitted in a continuous roll form. All input and output data shall include a brief synopsis of the computer program(s) stating required input, method of solution, approximations used, codes and specifications used, output generated, extent of previous usage or certification of the program(s), and program author(s). Generalized flow chart(s) may be used to supplement description of solution process, if desired. All computer generated and long-hand calculation sheets shall be identified by sheet number, indexing and cross-referencing. Each member or structure being analyzed shall be identified, dimensioned and shown in a loading diagram. A separate diagram shall be provided for each load case, such as dead plus live, dead plus wind, etc. Input and output values including intermediate values shall clearly be identified if such values are necessary for evaluation of the submittal.

1.9 MECHANICAL

The 100 percent final design submittal shall include all the information presented in the 60 percent submittal, updated to final design status, corrected to reflect any changes made in response to review comments, and shall include the additional requirements specified hereinafter. Any concerns in developing the final design documents shall be resolved prior to starting the final design stage.

1.9.1 DESIGN DRAWINGS

The final design drawings shall be fully coordinated with the design analysis and specifications. Provide sufficient plans, piping diagrams and isometrics, mechanical room sections, water and air flow diagrams, details, schedules, control diagrams, sequences of operation, etc., as necessary to define the design requirements. Large-scale plans of congested areas shall be provided. Coordinate with architectural design for provision of access panels for all concealed valves, traps and air vents, etc. Floor plans shall use the architectural floor plans as a basis, with the building outline half-toned. The final design drawings shall include all the requirements and drawings defined for the 60 percent submittal. In addition, the following new drawing requirements and drawings shall be provided:

1.9.1.1 Mechanical Abbreviation, Legend, and General Notes Sheet

On this sheet, include any mechanical general installation notes that may be required to clarify the construction intent that may not be readily apparent in the specifications or on the drawings. General notes may be provided on a separate sheet if space does not exist on the Abbreviation and Legend sheet.

1.9.1.2 Plumbing Drawings

Enlarged Toilet Room Plans:

Enlarged toilet room plans showing all fixtures, water, waste, and vent piping shall be provided for each toilet area. Enlarged plans shall be drawn at a minimum 1/4-inch = 1 foot scale.

1.9.1.3 Mechanical HVAC Drawings

Hot Water System Flow Diagrams:

Provide a hot water flow diagrams showing the boiler, pumps, and all connected heating equipment including radiant floor heating systems. Each equipment item shall show associated flowrate. All thermometers, pressure gauges, isolation and control valves, bypass piping, etc. shall be shown on the flow diagram.

Chilled Water System Flow Diagrams:

Provide a chilled water flow diagrams showing the coolers, pumps, and all connected cooling equipment. Each equipment item shall show associated flowrates. All thermometers, pressure gauges, isolation and control valves, bypass piping, etc. shall be shown on the flow diagrams.

1.9.1.4 HVAC Control Drawings

In addition to the updated Controls Legend and System Block Diagram Sheets, final HVAC control drawings for each system and item of equipment shall be in accordance with the following requirements:

Control Diagrams:

Control Diagrams shall be provided for each system or item of equipment. Systems diagrams shall include every major component installed in or connected to the system, and only one system shall be shown on each

diagram. Control Diagrams shall schematically show all sensors, controllers, actuators, indicators, and operator interface devices that are required for the complete automatic control and monitoring of the system. All sensing devices utilized in the control or instrumentation of the system, and all actuating devices shall be shown in their correct mechanical location and functionally interconnected to the other control devices which comprise the control loop. All controlling devices shall be shown with all functional interconnections to inputs and outputs. Each sensing, controlling, actuating, and indicating device shall have its own unique control loop tag identifier. Communication linkages required to complete the entire intended interface between operators and the control system shall be shown schematically. This includes interconnections between local temperature control panels and the base EMCS. All associated thermometers and pressure gauges, located in their correct mechanical locations, shall also be shown on the diagrams. See furnished Example HVAC Control Drawings for the required level of detail and formatting.

Sequence of Operations:

Sequence of Operations shall be provided for each item of equipment or system and shall fully describe the intended operation of the equipment or system in all different operating modes. As identified on the furnished Example Control Drawings, each Sequence shall be broken down by individual control loops and shall include descriptions of both normal operating modes (running, shutdown, standby, etc.) and abnormal, emergency or safety related modes. Sequences shall include a description of all indication instrumentation, alarm conditions, and automatic actions to be taken upon occurrence of alarm conditions. Each device referenced in the sequence shall be referred to by its unique tag identifier, with each component designator shown in parenthesis. Design setpoints shall be specified for each control loop and indicated as being adjustable. See furnished Example HVAC Control Drawings for the required level of detail and formatting.

The designer shall analyze every component of each system and write each Sequence of Operation to compliment the Functional Performance Checklists. The Sequence of Control on the project drawings shall be explicit and written to ensure that all the requirements of the "Functional Performance Test Checklists" can be accomplished.

Control Points Lists:

Control points lists, identifying each temperature control system input and output, shall be developed for each temperature control panel. See furnished Example HVAC Control Drawings for the required level of detail and formatting.

1.9.2 TECHNICAL SPECIFICATIONS

The submitted 60 percent technical guide specifications shall be updated, completely edited, and fully coordinated with the drawings to accurately and clearly identify the final product and installation requirements for the facility.

1.9.3 DESIGN ANALYSIS NARRATIVE

The Final Design Analysis Narrative shall include the information presented in the 60 percent submittal, shall be corrected to reflect changes in content made in response to review comments, and shall be expanded to reflect the completed design.

1.9.4 DESIGN ANALYSIS CALCULATIONS

The Final Design Analysis calculations shall include all the information presented in the 60 percent submittal, shall be corrected to reflect changes in content made in response to review comments, and shall be expanded to reflect the completed design. In addition, the following new calculations shall be provided:

- a. Pipe sizing calculations for the chilled & heating hot water, plumbing, gas piping systems.
- b. Chilled & heating hot water pump head calculations.
- c. Chilled & heating hot water expansion tank sizing.
- d. External static pressure calculations for all fans.
- e. Control Valve CV calculations.
- f. Electrical/Communications room calculations

1.10 ELECTRICAL

1.10.1 Drawings

Drawing scale shall match architectural drawing requirements.

1.10.1.1 Interior Drawings

Drawings shall be complete and accurate in every detail and shall include arrangements and types of light fixtures, receptacles, switching, location of special features, necessary details, including legends, fixture schedule, panel schedules, one-line diagrams, layout or functional diagrams for each of the various systems, riser diagrams if applicable, estimated maximum demand for each panel and for entire building and any other relative information which will help clear up any and all questionable items on the plans or in the specifications toward the development of a set of plans which will be clear, concise and correct. Additional drawing requirements for specific equipment or systems have been included in subsequent paragraphs pertaining to the equipment or systems.

1.10.1.2 Floor Plans

All rooms must be identified by name and number. Plans must be legible. Plans shall be developed using the same scale and areas as the architectural floor plans. Separate floor plans must be provided for lighting, power, communications, and fire detection.

1.10.1.3 Diagrams

The power one-line diagram shall be on a dedicated sheet. The diagram should show ratings of major equipment including short circuit ratings. Power, communications diagrams, fire detection and telephone diagrams should be on separate sheets also.

1.10.1.4 Schedules

Provide panelboard and lighting fixture schedules. Panelboard schedules shall include the designation, location, mounting (flush or surface), number of phases and wires, voltage, ampacity and total connected and demand load. Indicate the trip rating, frame size, interrupting rating and number of poles for each circuit breaker in the panelboards. List the circuit number, circuit description and load for each branch circuit.

1.10.1.5 Exterior Drawings

Drawings shall be complete and accurate in all details and shall include the routing of all feeder and branch circuits.

1.10.2 Specifications

All specifications shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product, installation requirements, and testing methods for this facility.

1.10.3 Design Analysis Narrative

The text of the preliminary design analysis should be expanded to reflect the completed design. Calculations used to develop the design should be included. The document in its final form should conform in all applicable respects to the requirements of Section 01007 ELECTRICAL DESIGN REQUIREMENTS.

1.10.4 Design Analysis Calculations

Backup data shall be furnished to support basic design decisions related to sizing of major equipment and materials, selection of economic alternatives, performance of specific systems or equipment. Calculations may be performed by manual or computerized procedures. Use of standardized charts, curves, tables, graphs will generally be acceptable for portions of required calculations or in lieu of specific calculation procedures. Such data must be from a recognized source which is identified in the design analysis. If possible, a copy of applicable sheets or pages should be included with the calculations. For given equipment, the calculations must conform to requirements identified under subsequent paragraphs herein pertaining to the equipment.

1.10.4.1 Service

Sizing of building service.

1.10.4.2 Transformers

Sizing of all transformers. (Generally for dry type transformers, 1 or 2 samples of detailed calculations to identify the method are sufficient, if input data for remaining units can be derived from panel or feeder sizing data.)

1.10.4.3 Feeders

Sizing of feeders (One detailed sample calculation is sufficient to establish the procedure, remaining data can be in schedules, tables, etc.).

1.10.4.4 Panelboards

Sizing and loading of panelboards and distribution equipment.

1.10.4.5 Voltage drop determination

Provide voltage drop calculations in accordance with IEEE 241 to demonstrate that the voltage drop requirements of NFPA 70 are satisfied.

1.10.4.6 Illumination calculations

Data should identify target and calculated illumination levels for all rooms and areas. Calculations should be adjusted to compensate for special applications -- irregularly shaped rooms, open sides, ceiling obstructions (beams, ductwork), corridors, etc. If the lumen method is used for corridor calculations, the calculations should be performed using a module in which the length doesn't exceed 3 times the width (2:1 ratio preferred).

1.10.4.7 Short Circuit Evaluation

Calculate the fault current in accordance with IEEE 242 for each node in the electrical distribution system.

1.10.4.8 Protective Coordination Analysis

A protective coordination study shall be performed to show that the power system is selectively coordinated and is fully coordinated with the upstream overcurrent devices. The study shall include the interior electrical distribution system and primary distribution system back to the existing primary line. The protective coordination / short circuit study shall be complete and approved by the government before any changes are made to the existing equipment.

1.10.4.9 Specialized Applications

Additional engineering backup should be included to address special requirements such as accommodation of nonlinear loads, harmonics analysis, energy studies, etc.

1.11 FIRE PROTECTION

1.11.1 DRAWINGS

Design will be an extension of the 60% submittal, incorporating all comments thereto and any revised criteria, all as specifically directed by the District Office. All conflicts, lack of specific criteria, and/or direction, inconsistencies, ambiguities, and lack of thorough understanding of the nature and scope of work shall be resolved prior to starting final design work. The fire protection plans shall show the following: entire sprinkler system; fire detection system, to include control panels, remote annunciators, alarm notification devices, and each initiating device; fire walls; fire partitions; building separations; other fire protection features.

1.11.2 DESIGN ANALYSIS

The final design analysis will be an extension of the 60% design analysis and shall be complete for every item covered in the design and will include, but not be limited to, the following:

- a. List of design criteria.

- b. Design conditions.
- c. Design calculations.
- d. Complete description of system alarm zones.
- e. Complete description of system sprinkler system.
- f. Complete description of the building fire protection features.
- g. Other pertinent information of value for future use in construction contract administration, substantiation of design methods, or permanent record shall be included.

1.11.3 TECHNICAL GUIDE SPECIFICATIONS

The following UFGS guide specifications shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product and installation requirements for the facility:

13930a Wet-Pipe Sprinkler System, Fire Protection

13851a Fire Detection System and Alarm System,
Addressable

All items identified in the specifications not required shall be marked for deletion in accordance with the requirements of Section 01332 SUBMITTALS DURING DESIGN. Those items of equipment, materials, or installation requirements that are required are not permitted to be modified or changed from that presently shown. Government approval is required for the final submittal of these guide specs.

1.12 ENVIRONMENTAL PROTECTION, COMPLIANCE, AND PERMITS

1.12.1 General Requirements

Any additional environmental requirements, identified after submittal of the 60% Design documents, shall be include in the 100% Environmental Protection, Compliance, and Permits Design Analysis Chapter and the Environmental Protection Plan for the project.

1.12.2 Design Analysis Chapter

The Contractor shall update the chapter in the Design Analysis entitled: "ENVIRONMENTAL PROTECTION, COMPLIANCE, AND PERMITS" that was submitted at 60%. The updated chapter shall include additional summaries of environmental coordination, compliance, approvals, permits, and etc. required for the project since 60% submittals. The Contractor shall include additional documentations of the coordination, discussions, phone conversation records, and/or letters required to assure that the project is in full compliance with all Federal, State, and local environmental laws and regulations. The Contractor shall included an updated list of environmental permits, approvals, notifications, etc. that are required for the project which was submitted with the 60% submittal.

1.12.3 Environmental Protection Plan

The Contractor shall prepare and submit a Final Design Environmental

Protection Plan in accordance with the requirements of Section 01355 ENVIRONMENTAL PROTECTION and any additional environmental compliance plans that have been identified during the design.

1.12.4 Appendix to the Environmental Protection Plan

As an Appendix to the Final Environmental Protection Plan, the Contractor shall submit copies of the completed permit applications and associated documents, notices, reviews, and/or approvals that are required for the project. Copies of all permits and/or approvals that are required for the project prior to start of construction shall be included in the Appendix. Copies of any additional requirements and/or conditions of the permits/approvals, which are required to be submitted during and/or at completion of construction, shall be included in the Appendix.

1.12.5 NPDES Storm Water Permit

If the project requires coverage under the General NPDES Permit for Storm Water Discharges from a Construction Site, the Contractor shall submit the following.

1.12.5.1 Notice of Intent (NOI)

Parts I and II of the Contractor's NOI shall be completed.

1.12.5.2 Notice of Termination (NOT)

Parts II and III of the NOT shall be completed.

1.12.5.3 Storm Water Pollution Prevention Plan (SWPPP)

Complete the Storm Water Pollution Prevention Plan. A SWPPP outline is available at <ftp:\ftp.nwo.usace.army.mil/pub/ae/SWPPP/SWPPP.DOC>.

1.13 SUSTAINABLE DESIGN REQUIREMENTS

Provide a list of sustainable design features actually incorporated into the design of this facility.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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SECTION 01355

ENVIRONMENT PROTECTION, COMPLIANCE, AND PERMITS
10/00

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AIR FORCE INSTRUCTION

AFI 32-1053 Pest Management Program

CODE OF FEDERAL REGULATIONS (CFR)

33 CFR 328	Definitions
40 CFR 68	Chemical Accident Prevention Provisions
40 CFR 152 - 186	Pesticide Programs
40 CFR 260	Hazardous Waste Management System: General,
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification

COLORADO CODE OF REGULATIONS

6 CCR 1007-3 Part 262.34(c) Hazardous Waste

ENGINEERING MANUALS (EM)

EM 385-1-1 (1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

BUCKLEY AFB

APP Affirmative Procurement Plan

ICP

Integrated Contingency Plan

US ARMY CORPS OF ENGINEERS TECHNICAL REPORT

WETLAND MANUAL

Corps of Engineers Wetlands Delineation
Manual Technical Report Y-87-1

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste are materials that, if abandoned or disposed of, meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include but are not limited to excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), excess paints, excess solvents, and excess pesticides

1.2.4 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor shall discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" shall occur. Land Application shall be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.5 Pesticide

Pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.2.6 Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other

organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.7 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, creeks, and/or "waters of the United States" and would require a permit from the governing agency.

1.2.8 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.2.9 Wetlands

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with the Corps of Engineers WETLAND MANUAL. Any final determination of wetland delineation conducted by the Contractor shall have concurrence from the Contracting Officer.

1.3 GENERAL REQUIREMENTS

The Contractor shall be responsible for ensuring that the project is constructed in full compliance with all applicable Federal, State, Local and Regional environmental laws and regulations. The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

1.5 CERTIFICATION REQUIREMENTS

An environmental agency may require design and construction documents to be certified by a Professional Engineer (PE) registered in the State of Colorado. The Contractor shall comply with the certification requirements of the environmental regulatory agencies.

1.6 ENVIRONMENTAL COORDINATION, PERMITS, NOTICES, REVIEWS AND/OR APPROVALS

The Contractor shall be responsible for contacting the appropriate Federal, State, Regional, and local environmental agencies to identify all required environmental permits (construction and operating), notices, reviews, and

approvals required for the project. Once the requirements are identified, the Contractor shall be responsible for coordinating the requirements with Buckley AFB's Environmental Flight and the Contracting Officer in regard to implementation for a Federal Facility project. The Contractor shall ensure that all coordination, permits, notices, reviews and/or approvals are completed and submitted with each applicable phase of the design. Prior to construction starting for any phase, the Contractor shall assure that all permits and/or approvals are received and copies are submitted to the Contracting Officer. The Contractor shall be responsible for any contract delays resulting from failure to obtain environmental permits, notices, reviews and/or approvals when required.

1.6.1 Applications, Supporting Documents, and Fees

The Contractor shall obtain and complete all environmental permit applications and notices including any documents required for a modification for an existing permit held by the Facility. The Contractor is responsible for preparing all supporting documents, including but not limited to engineering reports, emission surveys, diagrams, pollutant load calculations, etc. If, in lieu of permits, the governing agency requires review and approval of the design, the Contractor shall submit and obtain approval of the design and associated documents. The Contractor shall be responsible for all fees associated with the permits, applications, reviews, approvals, and notices.

1.6.2 Physical Fitness Center Buckley AFB's Environmental Permits, Notices, Reviews, and/or Approvals

The following is a listing of permits, notices, reviews, and/or approvals which **may be** required for this project. This listing and requirements are not to be considered all-inclusive by the Contractor, but is provided as information that may be used in successfully accomplishing the environmental compliances.

- a. In the State of Colorado, **EPA** has authority for the National Pollutant Discharge Elimination System (NPDES) program on **Federal Facilities**. If construction activities results in disturbance of 5 acres of land or more, coverage under the EPA Storm Water General Permit For Construction Activities (Permit No. COR10*##F) is required. The Contractor and the Omaha District Corps of Engineers shall be co-permittees. The Contractor shall be responsible for editing and applying Specification Section 01565 NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES and submittal requirements in Section 01338 100 PERCENT DESIGN REQUIREMENTS.
- b. A State of Colorado Air Pollution Emission Notice (APEN) for Fugitive Dust Permit for Land Development is required if construction disturbs surface areas of more than 25 contiguous acres or if surface areas of more than 1 acre are to remain disturbed more than six months. The Colorado Department of Public Health and Environment (CDPHE), Division Air Quality issues the permit and requires an APEN fee to be submitted with the application. The Contractor shall coordinate the requirements and submittals with Buckley AFB Environmental Flight, Air Quality Section. The permit is required prior to any construction starting on the project site. CDPHE requires a minimum of 30 days for review time and requires payment for the review time prior to issuing the permit.

- c. The Colorado Department of Public Health and Environment (CDPHE), Air Quality Division, may require an Air Pollutant Emission Notice (APEN) and a Permit-to-Construct for a new stationary source emitting an air pollutant. The Contractor shall review the State of Colorado Air Quality laws and regulations for applicability of APEN and/or permit requirements and shall coordinate the requirements and submittals with Buckley AFB Environmental Flight, Air Quality Section and the Contracting Officer.

1.7 AFFIRMATIVE PROCUREMENT PLAN (APP)

The Contractor shall refer to the Buckley AFB APP for guidelines when purchasing the following: paper and paper products, vehicle products (oil and tires), building insulation, structural fiberboard, laminated paperboard, cement, concrete, carpet, floor tiles, patio brick, shower and restroom dividers/partitions, latex paint, traffic cones and barricades, parking stops, delineators and channelizers, plastic fencing, hydraulic mulch, lawn and garden edging, waste and recycling receptacles, plastic desk top accessories, toner cartridges, binders, trash bags, printer ribbons, plastic envelopes, and pallets. The Contractor may review the plan at Buckley AFB's Environmental Flight.

1.8 PAYMENT

All costs associated with this section shall be included in the contract price. No separate payment will be made for work covered under this section. The Contractor shall be responsible for payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor. The Contractor shall be responsible for payment of all fines/fees for violations or non-compliance with Federal, State, and local environmental laws and regulations.

1.9 ENVIRONMENTAL PROTECTION PLAN

During the initial design phase, the Contractor shall submit an Environmental Protection Plan for compliance review and acceptance by the Contracting Officer. For each additional submittal phases, the plan shall be updated and submitted for compliance review and acceptance by the Contracting Officer. Prior to construction, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the environmental plan, possible subsequent additions and revisions to the plan including any reporting requirements, and methods for administration of the Contractor's environmental plans. The Contractor shall maintain a current version of the Environmental Protection Plan on site for review by interested parties.

1.9.1 Compliance.

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, submitting for compliance review, and implementing any additional requirements to be included in the Environmental Protection Plan.

1.9.2 Contents.

The environmental protection plan shall include, but shall not be limited

to, the following:

- a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.
- b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.
- c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
- d. Description of the Contractor's environmental protection personnel training program.
- e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.
- f. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.
- g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.
- h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.
- i. Drawing showing the location of non-commercial borrow areas. Protection measures required at the work site shall apply to the borrow areas including final restoration for subsequent beneficial use of the land.
- j. Spill Control Plan. The plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355 and/or regulated under State or local laws or regulations. The Spill Control Plan supplements the requirements of EM 385-1-1 and the Buckley AFB's ICP. This plan shall include as a minimum:
 1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Contracting Officer, Buckley AFB's Fire Department, and Buckley AFB's Environmental Flight in addition to the legally required Federal, State, and local reporting channels (including the

National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.
 3. Training requirements for Contractor's personnel and methods of accomplishing the training.
 4. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.
 5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.
 6. The methods and procedures to be used for expeditious contaminant cleanup.
- k. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction. The Contractor shall attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. The report shall be submitted on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and shall be for the previous quarter. (e.g. the first working day of January, April, July, and October.) The report shall indicate the total amount of waste generated in tons as well as total amount diverted and the percent diverted in tons.
- l. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. The plan shall detail the Contractor's actions to comply with and to participate in Federal, State, and local government sponsored recycling programs to reduce the volume of solid waste at the source.
- m. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site. A copy of the Land Disturbance Dust Control Plan which was submitted to the State of Colorado for the Fugitive Dust Control permit shall be included as an attachment to the plan.
- n. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum

quantities of each hazardous materials to be on site at any given time shall be included in the contaminant prevention plan. As new hazardous containing materials are brought on site or taken off site, the plan shall be updated. The Contractor shall furnish a copy of the initial and all updated contaminant prevention plans including each MSDS and quantities to Buckley AFB's Environmental Flight.

- o. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If disposal is to a sanitary sewer, the plan shall include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.
- p. A historical, archaeological, cultural, biological, and wetland resources plan that defines procedures for identifying and protecting the resources known to be on the project site and any resources discovered during design or construction. The plan shall identify lines of communication between Contractor personnel and the Contracting Officer.
- q. If applicable, a pesticide treatment plan shall be included and updated, as information becomes available. The plan shall include: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration number, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. The Contractor is responsible for Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation specific requirements. See AFI 32-1053 Section 3.4.13 for data required to be reported to the Installation.

1.9.3 Appendix

As an appendix to the Environmental Protection Plan, attach copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, termination documents, and/or associated documents to the environmental compliance packages.

1.10 PROTECTION FEATURES

This section supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any on-site construction activities, the Contractor and the Contracting Officer shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the contractor's assigned storage area and access route(s), as applicable. This report will be signed by both the Contracting Officer and the Contractor upon mutual agreement as to its accuracy and completeness. The Contractor shall protect those environmental features,

indicated on the drawings, in spite of interference which their preservation may cause to the Contractor's work under the contract.

1.11 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.

3.1.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are not to be disturbed shall be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.1.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.1.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs). BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Any temporary measures shall be removed after the area has been stabilized.

3.1.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.2 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.2.1 Wetlands

The Contractor shall not enter, disturb, destroy, or allow discharge of contaminants into wetlands without authorization from the Corps of Engineers Regulatory Division.

3.3 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with the State of Colorado's Air Quality laws and regulations and all Federal emission and performance laws and standards.

3.3.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants; shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would

cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations.

3.3.2 Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.3.3 Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise.

3.3.4 Burning

Burning shall be prohibited on the Government premises.

3.4 MANAGEMENT AND DISPOSAL OF WASTE AND CHEMICAL MATERIALS.

Disposal of wastes shall be as directed below unless otherwise specified in other sections and/or shown on the drawings.

3.4.1 Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill shall be the minimum acceptable off-site solid waste disposal option.

3.4.2 Chemicals and Chemical Wastes

Chemicals shall be dispensed ensuring no spillage to ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. This documentation will be periodically reviewed by the Government. Chemical waste shall be collected in corrosion resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes shall be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations.

3.4.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials.

Hazardous wastes are defined in 40 CFR 261, or as defined by applicable

State and local regulations. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. For Contractor Generated Hazardous Waste, the Contractor shall segregate hazardous waste from other materials and wastes and shall collect the waste in containers that have been identified for the specific hazardous waste. The Contractor shall properly identify each separate waste, which may include a need to sample and analyze any or all containers. The Contractor shall transfer Contractor Generated Hazardous Waste to the Installation's Central Accumulation Site within 24 hours of being generated unless the waste shall be managed in compliance with the Satellite Accumulation Provisions of 6 CCR 1007-3 Part 262.34(c). Hazardous Waste shall be removed from the Installation's Central Accumulation Site within 30 days. The Contractor shall be responsible for proper packaging, labeling, marking and transportation from the accumulation site to the ultimate disposal site. The Contractor shall be responsible for costs of transportation, treatment, and disposal of Contractor Generated Hazardous Waste. The Contractor shall ensure that the waste is disposed at a properly permitted facility and that all manifests, land disposal restriction notifications, and any other required documentation are provided to the Buckley AFB Environmental Flight and the Contracting Officer. The Contractor shall be responsible for all fines/penalties assessed due to Federal, State, and local laws and regulations being violated by the Contractor. Spills of hazardous or toxic materials shall be immediately reported to Buckley AFB Environmental Flight, Buckley AFB Fire Department, and the Contracting Officer. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility. The ultimate disposition of Contractor Generated Hazardous Waste and Excess Contractor Hazardous Materials shall be the Contractor's responsibility. The Contractor shall remove all Excess Hazardous Materials from the Installation within 30 days of the completion of the process requiring the hazardous materials.

3.4.4 Fuel and Lubricants

Storage, fueling, and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Lubricants and waste oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with Federal, State, and local laws and regulations. There shall be no storage of fuel on the project site. Fuel must be brought to the project site each day that work is performed.

3.4.5 Waste Water

Disposal of waste water shall be as specified below.

- a. Waste water from construction activities such as on-site material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. shall not be allowed to enter water ways or to be discharged to the surface. The Contractor shall dispose of the construction related waste water off-Government property in accordance with all Federal, State, and local laws and regulations.
- b. Ground water shall be land applied in accordance with all Federal, State, Regional, and Local laws and regulations for pumping and land applying ground water. Although the State of Colorado does not have jurisdiction for the NPDES program on Federal Facilities, the Contractor shall assure that the State of Colorado's Water

Quality laws and regulations are not violated when pumping and discharging water.

- c. Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing hydrostatic testing shall be land applied in accordance with all Federal, State, and local laws and regulations for land application or shall be discharged into the sanitary sewer with prior approval and/or notification to the Waste Water Treatment Plant's Operator.

3.5 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor shall participate in the following recycling and waste minimization activities to divert non-hazardous solid waste:

- (1) Shred fallen trees to use as mulch
- (2) Composting
- (3) Collection of aluminum cans at the job site for recycling.
- (4) Concrete recycled as riprap, road base etc.
- (5) Scrap metal.

The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

3.6 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT

The Contractor shall maintain an inventory of non-hazardous solid waste diversion and disposal of construction and demolition debris. The Contractor shall submit a report to Buckley AFB Environmental Flight and a copy of the report to the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that non-hazardous solid waste has been generated. The following shall be included in the report:

- a. Construction and Demolition (C&D) Debris Disposed =_____Cubic Yards or Tons
- b. Construction and Demolition (C&D) Debris Recycled=_____Cubic Yards or Tons
- c. Total C&D Debris Generated =_____Cubic Yards or Tons
- d. Waste Sent to Waste-To-Energy Incineration Plant (Do not included this amount in the recycled amount)=_____Cubic Yards or Tons

3.7 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or

burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in impact to or the destruction of these resources. The Contractor shall prevent Contractor Personnel or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.8 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. Particular attention shall be paid to threatened and endangered animal and plant species and to species of special concern under applicable Federal and State designation.

3.9 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor shall coordinate with the Installation Pest Management Coordinator (IPMC) at the earliest possible time prior to pesticide application. The Contractor shall discuss integrated pest management strategies with the IPMC and receive concurrence from the IPMC through the Contracting Officer prior to the application of any pesticide associated with these specifications. Installation pest management personnel shall be given the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. The use and management of pesticides are regulated under 40 CFR 152 - 186.

3.9.1 Pesticide Delivery and Storage

Pesticides shall be delivered to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Pesticides shall be stored according to manufacturer's instructions and under lock and key when unattended.

3.9.2 Qualifications

For the application of pesticides, the Contractor shall use the services of a subcontractor whose principal business is pest control. The subcontractor shall be licensed and certified in the State where the work is to be performed.

3.9.3 Pesticide Handling Requirements

The Contractor shall formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and shall use the clothing and personal protective equipment specified on the labeling for use during all phases of the application. Material Safety Data Sheets (MSDS) shall be available for all pesticide products.

3.9.4 Application

Pesticides shall be applied by a State Certified Pesticide Applicator in accordance with EPA label restrictions and recommendation. The Certified

Applicator shall wear clothing and personal protective equipment as specified on the pesticide label. Water used for formulating shall only come from locations designated by the Contracting Officer. The Contractor shall not allow the equipment to overflow. Prior to application of pesticide, all equipment shall be inspected for leaks, clogging, wear, or damage and shall be repaired prior to being used.

3.10 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. The Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements.

3.11 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for the length of time that the construction activities create the particular pollutant.

3.12 MILITARY MUNITIONS

In the event the Contractor discovers or uncovers military munitions as defined in 40 CFR 260, the Contractor shall immediately stop work in that area and immediately inform the Contracting Officer.

3.13 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/ pollution control. Anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants, shall be discussed. Other items to be discussed shall include recognition and protection of archaeological sites, artifacts, and endangered species and their habitat that are known to be in the area.

3.14 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with Contract Clauses: "Cleaning Up". The Contractor shall, unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

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SECTION 01400

SPECIAL SAFETY REQUIREMENTS

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SECTION 01400

SPECIAL SAFETY REQUIREMENTS
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1926	Safety and Health Regulations for Construction
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ENGINEERING MANUALS (EM)

EM 385-1-1	(1996 and Changes) Safety and Health Requirements Manual
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1.2 SUMMARY

1.2.1 General

This section provides guidelines for preparation of accident prevention plans, and to implement the accident prevention clause (this specification) and EM 385-1-1, Safety and Health Requirements Manual. The U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1 is available from U.S. Government bookstores operated by the Government Printing Office and a copy is included on the CD-ROM issued with this solicitation. Changes to EM 385-1-1 applicable to this contract include only those revisions posted at the following website (all revisions up to the time this solicitation is issued):

http://www.hq.usace.army.mil/soh/hqusace_soh.htm ("Changes to EM"). U.S. Government bookstores are located in most major cities including Milwaukee, Chicago, Kansas City, Denver, and Pueblo, Colorado.

1.2.2 Not Used

1.3 PRECONSTRUCTION CONFERENCE

See Contract Clause "PRECONSTRUCTION CONFERENCE". A preconstruction conference will be scheduled prior to beginning of site work. Requirements relative to planning and administration of the overall safety program will be discussed.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office

that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan; G-RE

The written site-specific Accident Prevention Plan.

1.5 ACCIDENT PREVENTION PLAN

The Contractor shall submit, prior to the start of on site construction activity, a proposed accident prevention plan which shall be the accident prevention policy to be followed by all of the Contractor's and subcontractor's personnel and supervisory staff during performance of the work.

1.5.1 Requirements

The proposed plan shall be developed after a careful analysis of the work involved and shall be tailored specifically to the conditions of this project. The Contractor's accident prevention plan shall contain, as a minimum, the following general information or procedures for the activity indicated. The Contractor shall submit his plan for review and acceptance prior to commencing work.

1.5.1.1 Responsible Individual(s)

The Contractor shall designate an onsite employee as the individual responsible for insuring the accident prevention plan is implemented and enforced.

1.5.1.2 Subcontractor Supervision

Explain procedures to assure that subcontractor(s) fully comply with the accident prevention plan.

1.5.1.3 Indoctrination of New Employees

The plan shall include provisions for advising workers of the purpose of the accident prevention plan, specific hazards on the job and precautions to be taken, emergency procedures, information concerning tool box safety meetings, required protective equipment, cleanup rules and location of company safety rules (posting or handout).

1.5.1.4 Tool Box Safety Meetings

Hold weekly "Tool Box" safety meetings. Timely safety subjects shall be determined by a responsible individual. Employees will be informed of time, location, who will conduct, and subject. Identify procedures for including subcontractors. The Contractor shall provide a copy of the Weekly Tool Box Meeting and Monthly Supervisor's Safety Meeting to the Contracting Officer.

1.5.1.5 Fire Prevention and Protection

Identify source of fire protection. Insure adequate fire extinguishers, water barrels, or other fire-fighting equipment is located on site. Explain prevention activities to include storage areas and special hazards

such as welding and use of flammable liquids, and other special hazards.

1.5.1.6 Housekeeping

Daily cleanup of all debris and waste materials is required. Adequate disposal containers should be placed strategically around the site. Debris shall be removed on a regular basis. Explain procedures that include use of barrels, dumpsters, trash chutes, etc.

1.5.1.7 Mechanical Equipment Inspection

All mechanical equipment (trucks, cranes, forklifts, backhoes, graders, etc.) shall be inspected prior to use and at fixed intervals throughout the life of the contract. Explain how inspections will be accomplished (frequency, by whom, and records to be kept).

1.5.1.8 First Aid and Medical Facilities

First aid facilities shall be made available on the job site. Arrangements for emergency medical attention shall be made prior to start of work. All emergency numbers (doctor, hospital, ambulance, fire department) shall be posted at the project superintendent's office.

1.5.1.9 Sanitation

Include provisions for toilet facilities, drinking water and washing facilities. A sufficient number of toilet facilities as specified in EM 385-1-1 shall be provided unless permission is granted to use existing facilities (portable chemical are authorized). Insure safe drinking water and individual cups are available. For the projects where corrosive or toxic materials are used, separate washing facilities are required.

1.5.1.10 Safety Promotions

The Contractor shall promote accident prevention. Identify method (posters, awards etc.).

1.5.1.11 Accident Reporting

All accidents (employee injuries, vehicle, building, or equipment damage etc.) regardless of their severity, shall be reported to the onsite government representative or to the area engineer, who in turn will advise the Contractor of forms to be submitted and timeframes.

1.5.1.12 Job Hazard Analysis

When job situations change and it is necessary to alter safety requirements, a Job Hazard Analysis will be accomplished, documented, and added as an addendum to the Accident Prevention Plan. Each Job Hazard Analysis shall include, but not be limited to, a description of the work, probable hazards related to that work and positive precautionary measures to be taken to reduce or eliminate each hazard. An example of changing situations may be new subcontractors performing work such as earth moving, trenching, concrete work, roofing, electrical, masonry etc. The onsite government representative will determine the format and amount of detail required of the written plan.

1.6 RADIOLOGICAL EQUIPMENT

In addition to any applicable Nuclear Regulatory Commission, state, local, or other federal licenses or permits, and in accordance with requirements of EM 385-1-1, Safety and Health Requirement Manual, the Contractor is required to obtain a service permit to use, store, operate, or handle a radiation producing machine or radioactive materials on a Department of Defense (DOD) Installation. The service permit shall be obtained from the appropriate U.S. Army or U.S. Air Force Command through the Contracting Officer's representative. The Contractor should notify the Contracting Officer during the prework conference if a radiation producing device will be utilized on a DOD Installation in order to determine the permit application requirements, and allow a lead time of 45 days for obtaining a permit.

1.7 EXCAVATION AND TRENCHING

The standards for excavation and trenching are outlined in 29 CFR 1926, Subpart P. These standards shall be followed in addition to those outlined in EM 385-1-1.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

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SECTION 01451A

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SECTION 01451A

CONTRACTOR QUALITY CONTROL
07/01; Omaha Rev. 10/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740	(2001) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(2000b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Pricing Schedule.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

3.2 QUALITY CONTROL PLAN

The Contractor shall furnish for review by the Government, not later than 10 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

- a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.
- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.
- c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.
- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.
- e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be approved by the Contracting Officer.)
- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.
- g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified

deficiencies have been corrected.

- h. Reporting procedures, including proposed reporting formats.
- i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 10 calendar days prior to the Coordination Meeting.

During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Contractor and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure safety and contract compliance. The Safety and Health Manager shall receive direction and authority from the CQC System Manager and shall serve as a member of the CQC staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The

Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, show drawing submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a construction person with a minimum of 5 years in related work. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned no other duties .

An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.4.3 CQC Personnel

A staff shall be maintained under the direction of the CQC system manager to perform all QC activities. The staff must be of sufficient size to ensure adequate QC coverage of all work phases, work shifts, and work crews involved in the construction. These personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned QC responsibilities and must be allowed sufficient time to carry out these responsibilities. The QC plan will clearly state the duties and responsibilities of each staff member.

3.4.4 Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This course is periodically offered at each of the four area offices in the Omaha District according to the following revolving training schedule:

<u>Badger Area</u>	First Session	Between 15 & 25 April
	Second Session	Between 15 & 25 October
Point of Contact	Roy Brewer	(608) 388-4780
<u>Black Hills Area</u>	First Session	Between 1 & 10 March
	Second Session	Between 1 & 10 September
Point of Contact	Dwight Pochant	(605) 923-2983
<u>Fort Crook Area</u>	First Session	Between 15 & 25 January
	Second Session	Between 15 & 25 July
Point of Contact	Al Kreisler	(402) 293-2540

<u>Rocky Mountain</u>	First Session	Between 1 & 10 June
	Second Session	Between 1 & 10 December
Point of Contact	Paul Jendzejec	(719) 556-4184

The exact date and location for the sessions will be determined approximately 30 days in advance of the training. The cost of training is presently established at \$25 to be paid by each student in advance of the training. For information about a particular session, the best source is the point of contact listed above.

3.4.5 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals and deliverables are in compliance with the contract requirements. When Section 15950A HEATING, VENTILATING AND AIR CONDITIONING (HVAC) CONTROL SYSTEMS; 15951A DIRECT DIGITAL CONTROL FOR HVAC; 15990A TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS; or 15995A COMMISSIONING OF HVAC SYSTEMS are included in the contract, the submittals required by those sections shall be coordinated with Section 01330 SUBMITTAL PROCEDURES to ensure adequate time is allowed for each type of submittal required.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

- a. A review of each paragraph of applicable specifications, reference codes, and standards. Prior to the preparatory meeting for each definable feature of work, the Contractor shall provide all technical references (i.e. building codes, life safety codes, etc.) referenced in the project specifications for feature(s) of work being addressed at the preparatory meeting. These technical references shall be onsite and available for use by Contractor and Government personnel before the preparatory meeting is held and maintained until the feature(s) of work is/are accepted by the Government.
- b. A review of the contract drawings.

- c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.
- d. Review of provisions that have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- g. A review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
- i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
- j. Discussion of the initial control phase.
- k. The Government shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

- a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

- f. The Government shall be notified at least 48 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.
- g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.
- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If

approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed the actual cost for the recheck to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Resident or Area (as directed) Office

Coordination for each specific test, exact delivery location, and dates will be made through the Resident or Area (as directed) Office.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the Special Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. A punch list of items which do not conform to the approved drawings and specifications shall be prepared and included in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected.

Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

- a. Contractor/subcontractor and their area of responsibility.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
- d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

- e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.
- g. Offsite surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- i. Instructions given/received and conflicts in plans and/or specifications.
- j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Contracting Officer's Representative on the first day following the date(s) covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 SAMPLE FORMS

Sample forms enclosed at the end of this section.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

DAILY QUALITY CONTROL REPORT

DATE: _____

Project Title & Location:

Weather: _____ Precipitation: _____ in. _____ Temp: _____ Min. _____ Max. _____

NUMBER:	TRADE	:	HOURS	:	EMPLOYER	:	LOCATION/DESCRIPTION WORK
1	Electrician	:	40	:	ABC Company	:	Industrial Plant
2	Plumber	:	30	:	XYZ Corp	:	Commercial Building
3	Painter	:	20	:	DEF Inc	:	Residential House
4	Carpenter	:	15	:	GHI LLC	:	Construction Site
5	Mechanic	:	25	:	JKL Motors	:	Automotive Shop
6	Electrician	:	35	:	MNO Energy	:	Power Station
7	Plumber	:	20	:	PQR Plumbing	:	Public Works
8	Painter	:	10	:	RST Painting	:	Art Studio
9	Carpenter	:	15	:	UVW Carpentry	:	Historic Building
10	Mechanic	:	20	:	XYZ Auto	:	Repair Shop

[illegible][illegible]

3. Work Performed Today: (Indicate location and description of work performed by prime and/or subcontractors. When network analysis is used, identify work by NAS activity number).

4. Control Activities Performed:

Preparatory Inspections: (Identify feature of work and attach minutes).

Initial Inspections: (Identify feature of work and attach minutes).

Follow-Up Inspections: (List inspections performed, results of inspection compared to specification requirements, and corrective actions taken when deficiencies are noted).

5. Tests Performed and Test Results: (Identify test requirement by paragraph number in specifications and/or sheet number in plans).

6. Material Received: (Note inspection results and storage provided).

7. Submittals Reviewed:

(a) Submittal No.	(b) Spec/Plan Reference	(c) By Whom	(d) Action
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

8. Offsite Surveillance Activities, Including Action Taken:

9. Job Safety: (List items checked, results, instructions and corrective actions taken).

10. Remarks: (Instructions received or given. Conflict(s) in Plans and/or specifications. Delays encountered.).

Contractor's Verification: On behalf of the Contractor, I certify this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications, to the best of my knowledge, except as may be noted above.

CQC System Manager

Date

-- End of Section --

REQUEST FOR PROPOSAL DOCUMENTS FOR
CONSTRUCTION OF

**PHYSICAL FITNESS CENTER
CRWU 02-3001**

BUCKLEY AFB, COLORADO

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ATTACHMENTS

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ATTACHMENT NO. 1

RESERVED

RESERVED

ATTACHMENT NO. 1 - i

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ATTACHMENT NO. 2
FINAL FOUNDATION ANALYSIS

**FINAL FOUNDATION ANALYSIS
PHYSICAL FITNESS CENTER
BUCKLEY AFB, COLORADO**

1. Scope

The results of the field investigation and analysis for the Physical Fitness Center at Buckley AFB, Colorado are presented in this report. An investigation report prepared for the nearby Shopping Center was referenced for information on previously used design information; this report is based on a site-specific subsurface investigation. Laboratory testing has been completed and final design recommendations are based on these.

2. Proposed Construction

This project involves the construction of an approximately 5000 to 6000 square meter (54,000 to 65,000 square foot) facility with large open spaces including a gymnasium and racquetball courts. Other areas include instructional rooms, locker room facilities and administrative areas. Options include a swimming pool, additional ball courts and a weight and exercise area. The recommendations are applicable to these optional areas as well.

3. Subsurface Investigations

3.1. General

The field investigation for the Physical Fitness Center at Buckley AFB was conducted on August 1 to 3, 2001 by an Omaha District drill crew. The exploratory program consisted of six test borings numbered sequentially from BU01-10 through BU01-15. The borings were advanced with a Gus Pech 750C truck-mounted soil-sampling rig using 15.9-cm (6.25-inch) inside-inside diameter (I.D.) hollow stem augers. Borings for the building were drilled to a depth of 6.09 meters (20 feet); those for pavement were drilled to a depth of 3.05 meters (10 feet). Borings were located and staked in the field by the drill crew by measuring distances from existing structures. Base personnel provided utility clearances with assistance from the Corps of Engineers Field Geologist.

TABLE 1: Summary of Borings

Boring Number	Date Drilled	Total Depth M (ft)	Water During Drilling (ft)	Water After Drilling (ft)
BU01-10	2 Aug 2001	3.05 (10)	Not Encountered	Not Encountered
BU01-11	3 Aug 2001	6.09 (20)	Not Encountered	Not Encountered
BU01-12	2 Aug 2001	6.09 (20)	Not Encountered	Not Encountered
BU01-13	2 Aug 2001	6.09 (20)	Not Encountered	Not Encountered
BU01-14	2 Aug 2001	6.09 (20)	Not Encountered	Not Encountered
BU01-15	1 Aug 2001	6.09 (20)	Not Encountered	Not Encountered

3.2. Standard Penetration Tests

Standard penetration tests were taken in all borings at depth intervals of 76 cm (2.5 feet) for the first 3.05 m (10 feet) and every 1.52 m (5 feet) for the remaining depth of the boring. The standard penetration samples were obtained in accordance with ASTM D 1586-84 "Penetration Test and Split-Barrel Sampling of Soils", using a 63.5-kg (140-pound) automatic trip hammer.

3.3. Disturbed Sampling

Representative disturbed samples of the subsoils were taken with a 50.8 mm (2.0-inch) O.D. standard steel split spoon sampler using a 140 pound automatic SPT hammer, in accordance with ASTM D 1586-84. Samples were collected every 76 cm (2.5 feet) for the first 3.05 m (10 feet), then every 1.52 m (5 feet) for the remaining depth of the hole. Samples were placed in a pint jar and the lid sealed airtight with at least three wraps of electrical tape. Each jar was labeled, denoting the hole number, sample number, depth of sample, date collected, and the project name. The jars were placed in wooden boxes that were subsequently labeled with the appropriate project information.

3.4. Undisturbed Sampling

Undisturbed samples were taken using 76.2-mm (3-inch) O.D. Shelby tubes. The Shelby tubes were hydraulically pushed a distance of 61 cm (2 feet); the pressure exerted (pounds per square inch) and duration (seconds) of the 61 cm (2 foot) push were recorded on the field log. Undisturbed samples were taken at depths of 1.52-2.13 m (5-7 feet) and from 3.05-3.66 m (10-12 feet) in borings BU01-11, BU01-13 and BU01-15. Undisturbed Shelby tube samples were secured with packers and endcaps; endcaps were secured with at least five wraps of electrical tape. Shelby tubes were wiped clean and labeled on the outside with project, hole and depth information; in addition, a sample tag was completed and placed inside the tube prior to securing the endcaps. The tubes were placed inside foam-padded wooden boxes for shipment. Each box was labeled and secured with strapping tape to prevent accidental opening during shipment. All jar and Shelby tube samples with transmittal sheets were delivered to the Omaha District Quality Assurance Facility.

4. Laboratory Testing

Tests to determine visual classification, Atterberg Limits, grain size distribution, natural moisture content, sulfate ion content, soil pH, soil resistivity, and consolidation and swell potential were performed on representative samples. All tests were conducted in accordance with EM 1110-2-1906 "Laboratory Soils Testing".

Based upon the results of the testing program, the field logs were revised and depicted on the final boring logs. The final logs represent an interpretation and compilation of the content of the field logs and the results of the laboratory tests of the field samples. Boring logs are shown on the RFP drawings and are also available from Soils A Section of the Omaha District, USACE.

5. Site Conditions

5.1. General Geology

Buckley ANG is located within the Colorado Piedmont section of the Great Plains Physiographic Province. This section is an old erosion surface characterized by broadly rolling but locally scarped terrain. The area is drained by the South Platte River and its tributaries. Bedrock in the area is the Denver Formation, of Cretaceous to early Tertiary age. The Denver Formation is reportedly 290 m (950 feet) thick and is comprised of clay shales, arkosic sandstones, claystones, conglomerates, and local coal beds. Bedrock generally lies at a depth of approximately

13.7 to 15.2 m (45 to 50 feet) below the surface in the area. Overburden soils are generally either alluvial, colluvial, or eolian in origin.

5.2. Site-Specific Geology

Based on visual descriptions, the predominant soil types at the site are clay and silt with fine sand. These are typical of the soils encountered at the installation.

5.3. Ground Water

Ground water was not encountered within the explored depth of the investigation. Ground water in the area is generally located at the contact between unconsolidated soils and the uppermost bedrock unit, typically at approximately 15.2 m (50 feet) or greater below the surface. Infrequent instances of perched water at shallower depth have been reported during construction, however the volumes have been small and controllable with portable pumps and trenching. During investigation for the nearby shopping center holes of 15.2 m (50 feet) depth did not contain water after being open for up to eleven days.

5.4. Seismic Evaluation

The state of Colorado has a low to moderate frequency of earthquakes in historic time. In reference to the NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Structures (1977), and USACE TI 809-04 "Seismic Design for Buildings" (December 1998), this site has a Site Classification of D, a short period spectral acceleration, S_s , of 0.19g, and a one-second spectral analysis acceleration S_1 , of 0.058g.

6. Subsurface Recommendations

6.1. General

Soils at the project site consist primarily of clay and silt mixed with fine sand. Based on visual description and laboratory testing, high plasticity clay is not widespread, but is present. If encountered during excavation, this material should not be subsequently used for structural fill or backfill material against walls or in contact with floor slabs. Refer to backfilling recommendations for a definition of appropriate structural fill. Prior to adding fill to the site, topsoil should be stripped and the subgrade soils scarified and recompacted. A slope of at least 1 percent and preferably 5 percent should be maintained within 3.05 m (10 feet) of structures to ensure adequate drainage.

6.2. Foundation Recommendations

6.2.1. Shallow Spread and Continuous Footings

Two foundation types may be used for this design. These are shallow spread and continuous footings bearing on a layer of recompacted structural fill, or drilled piers with grade beams and structurally supported floors.

Spread footings bearing on the specified thickness of structural fill should be designed for an allowable excess bearing capacity of 168 kPa (3500 psf). Continuous footings should be designed for an allowable excess bearing capacity of 153 kPa (3200 psf). These values represent the maximum allowable bearing pressures at the base of the footings in excess of that due to existing surrounding overburden.

Highly compressible soil below footing depth was indicated by test results. Even relatively light loading indicated settlement that would induce damaging movement of structures placed on the soil. Because of this, removal and replacement of this layer is necessary if the conventional foundation option is used. In order to ensure that damaging movement does not take place, 2.44 m (8 feet) of material below footings, and 1.83 m (6 feet) below

grade-supported floor slabs is recommended. This will remove the majority of the compressible material, and create a structural bridge on which foundation members may bear.

Backfill for the over excavation should consist of non-expansive material, either imported or from on site, meeting the following specifications. The material shall contain not more than 50 percent passing the No. 200 sieve, have a liquid limit of less than 30 and a plasticity index of less than 15. The majority of on site materials will not meet these specifications. Backfill should be placed in maximum 20 cm (8-inch) lifts, with each compacted to not less than 95 percent of maximum Modified density.

All exterior footings for heated structures should be founded a minimum of 1.07 m (3.5 feet) below final exterior grade to provide adequate frost protection.

All footings for unheated structures should be founded a minimum of 1.07 m (3.5 feet) below final exterior grade to provide adequate frost protection.

6.2.2. Drilled Piers

Straight shaft cast-in-place drilled piers with grade beams and structurally supported floors may also be used. This system was used at the shopping center, and is applicable to the fitness center site as well.

Piers should be designed with a minimum length of 7.62 m (25 feet), an end-bearing value of 335 kPa (7000 psf), and a side friction value of 33.5 kPa (700 psf) for that portion greater than 2.44 m (8 feet) below the surface. Piers should have a minimum diameter of 40.5 cm (12 inches) and be continuously reinforced to prevent tensional failure. Reinforcement members should have spacers or other centering devices to ensure that at least 51 mm (2 inches) of concrete covers them. Failure to provide this minimum cover may allow corrosion of the reinforcement and weakening of the pier. Piers should be completed as soon after drilling as possible; reinforcement and concrete should be placed the same day. The uppermost five feet of the pier bore hole, and any zones that show signs of caving in, should be lined with sonotubes to create uniform diameters and prevent mushrooming near the surface. It is not recommended that slurry be used to keep the holes open due to the dry and potentially expansive nature of site soils. The minimum pier spacing for clusters should be no less than three pier diameters.

Vitally important is the need to leave no loose soil at the base of the pier hole. As little as fifty millimeters (two inches) of loose soil can prevent development of end-bearing pressure. Concrete must be placed via tremie to prevent segregation of aggregate during free fall and to lessen the possibility of leaving voids. The discharge point of the tremie should be maintained below the level of the concrete as it is being placed.

6.3. Floor Slabs

6.3.1. Slabs on Grade

If conventional footings and grade-supported floor slabs are to be used, a vapor barrier overlying a 152 mm (6-inch) capillary water barrier will be required beneath all floor slabs on grade. A modulus of subgrade reaction "K" of 6.95 kg/cm³ (250 pci) is recommended for this case (without frost penetration).

6.3.2. Structural Floors

Floors supported by grade beams must have a minimum void of 152 mm (6 inches) between the base of the slab and soil. A similar void must be provided between the grade beams and soil to prevent uplift due to soil expansion.

No density requirements are specified for soil placed beneath structurally supported floor slabs. However, soil placed against the interior side of exterior walls should be compacted to at least 90 percent of maximum Modified

density or the same density as that placed on the exterior side of the wall, if greater, to prevent differential pressure. This density requirement is specified for a distance at least 1.52 m (5 feet) away from the wall.

6.4. Swimming Pool Option

The swimming pool should be provided with a uniform bearing surface if shallow footings are to be used. It is recommended that over excavation extend to not less than four feet below the deepest portion of the pool, or to the same elevation as the building over excavation, whichever is greater. Due to the possibility of compressible or collapse susceptible material at shallower depth, the entire pool footprint should be excavated to this depth. The same backfilling and compaction provisions as outlined for the building footings apply.

Drilled piers should be designed as specified for the building foundation.

Regardless of which foundation system is used, a subsurface drain should be included for the pool to prevent accumulation of ground water, surface infiltration or water resulting from a leak in the pool structure. If conventional footings are used, the area around the sides of the pool shell and to a depth equal to at least the base of footings should be drained. If drilled piers are used, the area around the sides of the pool shell and immediately under the shell should be drained. Either granular natural or synthetic drainage media is acceptable provided they have the capacity to effectively drain the zone and convey collected water efficiently to a removal point. If granular native drainage media is used it must be of the correct gradation and particle shape to allow adequate compaction for structural support of the pool shell if the design relies on such support.

6.5. Pavement Design

Soils underlying pavement are predominantly silty or sandy clay. These soils have a frost design classification of F3.

If rigid pavement design does not consider frost penetration, a modulus of subgrade reaction "K" of 3.48 kg/cm³ (125 pci) is recommended for design purposes. Flexible pavement designs should use a California Bearing Ratio (CBR) value of 7 for subgrades compacted to 95 percent of maximum density per ASTM D 1557-78 when frost is not allowed to penetrate the subgrade. If frost penetration is considered in the design of rigid or flexible pavements, the design shall be in accordance with TM 5-818-2 "Pavement Design for Seasonal Frost Conditions".

6.6. Settlement

Based on consolidation tests performed on material from representative samples, total settlement of structures placed directly on the native soils would exceed allowable tolerances. If either the over excavation and backfilling with conventional footings or drilled piers and structural floors option is followed, total settlement should not exceed 25.4 mm (1.0 inch) under the recommended loading conditions. Differential settlement should not exceed 19.1 mm (0.75 inch) under such conditions.

6.7. Cementing Properties

Sulfate ion content tests were performed on representative samples. The results indicate a "moderate" sulfate exposure, less than 0.2 percent, in accordance with ACI 201.2. Sulfate-resistant cement will not be required.

Due to the potential for alkali-aggregate reactivity within the boundaries of the Omaha District, cement meeting the optional chemical requirements for low alkali cement on Table 2, ASTM C 150 will also be specified for all concrete. The Resource Conservation Recovery Act (RCRA) mandates, where possible, all concrete specifications will also include the option to use pozzolan as a partial replacement for Portland cement.

6.8. Corrosion Potential

Soil resistivity tests were performed on representative samples from site. Test results indicate a resistivity of 430-3030 ohm-cm. In accordance with corrosion classifications in the Department of the Army TM 5-811-4 (17 March 1965), "Electrical Design, Corrosion Control", a "severe" corrosion potential is expected. Soil pH results were 8.0 to 8.3.

7. Construction Considerations

This site previously had structures located on it and remains from these are reportedly being removed by the base prior to the start of construction for the Fitness Center.

ATTACHMENT NO. 3

INDEX OF UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

This includes UFGS specifications referenced and other UFGS specification sections required in developing the project specifications. Available sections are included on the CD-ROM is with this solicitation (In Specsintact Software). Directory on CD-ROM is "Guides".

List of available UFGS Sections is attached.

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 05120a 09/97 STRUCTURAL STEEL
 05210N 09/00 STEEL JOISTS [AND JOIST GIRDERS]
 05210a 11/88 STEEL JOISTS
 05300a 11/01 STEEL DECKING
 05310N 09/99 STEEL DECKS
 05400N 09/99 COLD-FORMED METAL FRAMING
 05400a 11/01 COLD-FORMED STEEL FRAMING
 05500N 09/99 METAL FABRICATIONS
 05500a 04/01 MISCELLANEOUS METAL

05502a 05/92 METALS: MISCELLANEOUS, STANDARD ARTICLES, SHOP FABRICATED
ITEMS
05615a 04/93 STOPLOGS
05650N 08/01 RAILROAD TRACK AND ACCESSORIES
05650a 05/01 RAILROADS
05652N 09/99 WELDING CRANE AND RAILROAD RAIL - THERMITE METHOD

DIVISION 06 - WOODS & PLASTICS

06100N 09/99 ROUGH CARPENTRY
06100a 10/01 ROUGH CARPENTRY
06200N 09/99 FINISH CARPENTRY
06200a 11/01 FINISH CARPENTRY
06410a 11/01 LAMINATE CLAD ARCHITECTURAL CASEWORK
06650 10/00 SOLID POLYMER (SOLID SURFACING) FABRICATIONS
06650N 09/99 SOLID POLYMER FABRICATIONS

DIVISION 07 - THERMAL & MOISTURE PROTECTION

07110a 09/98 BITUMINOUS DAMPPROOFING
07112N 09/99 BITUMINOUS DAMPPROOFING
07121N 09/99 BUILT-UP BITUMINOUS WATERPROOFING
07131a 09/98 ELASTOMERIC MEMBRANE WATERPROOFING
07132N 09/01 ELASTOMERIC SHEET WATERPROOFING
07132a 09/98 BITUMINOUS WATERPROOFING
07141N 09/99 FLUID-APPLIED WATERPROOFING
07161N 09/99 METALLIC OXIDE WATERPROOFING
07170N 09/99 BENTONITE WATERPROOFING
07190N 09/99 WATER REPELLENTS
07212N 09/99 MINERAL FIBER BLANKET INSULATION
07214N 09/99 BOARD AND BLOCK INSULATION
07216N 09/00 LOOSE FILL THERMAL INSULATION
07220N 03/00 ROOF AND DECK INSULATION
07220a 10/01 ROOF INSULATION
07240 10/01 EXTERIOR INSULATION AND FINISH SYSTEMS
07310 02/95 SLATE ROOFING
07311N 09/99 ASPHALT SHINGLES
07311a 08/98 ROOFING, STRIP SHINGLES
07320N 09/99 ROOF TILES
07320a 02/95 CLAY TILE ROOFING
07410N 09/99 METAL ROOF AND WALL PANELS
07412a 10/01 NON-STRUCTURAL METAL ROOFING
07413a 10/01 METAL SIDING
07416a 11/01 STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM
07510a 10/01 BUILT-UP ROOFING
07511N 09/99 BUILT-UP ASPHALT ROOFING (AGGREGATE SURFACED)
07512N 09/99 BUILT-UP ASPHALT ROOFING (SMOOTH SURFACED)
07513N 09/99 BUILT-UP ASPHALT ROOFING (MINERAL SURFACED)
07515a 11/01 PROTECTED MEMBRANE ROOFING (PMR)
07530a 09/95 ELASTOMERIC ROOFING (EPDM)
07531N 09/99 CHLOROSULFONATED POLYETHYLENE ROOFING (CSPE)
07532N 09/99 POLYISOBUTYLENE (PIB) ROOFING
07536N 09/99 ETHYLENE PROPYLENE DIENE MONOMER (EPDM) ROOFING
07541N 09/99 POLYVINYL CHLORIDE (PVC) ROOFING
07542N 09/99 THERMOPLASTIC ALLOY (TPA) ROOFING
07548a 08/97 POLYVINYL CHLORIDE (PVC) ROOFING
07550N 09/99 MODIFIED BITUMINOUS MEMBRANE ROOFING
07551a 09/01 MODIFIED BITUMEN ROOFING
07570a 11/01 SPRAYED POLYURETHANE FOAM (SPF) ROOFING

07571N 09/99 FOAMED ROOFING
 07572N 09/99 COATINGS FOR FOAMED ROOFING
 07580N 09/99 ROLL ROOFING
 07600N 09/99 FLASHING AND SHEET METAL
 07600a 11/01 SHEET METALWORK, GENERAL
 07610 08/94 COPPER ROOF SYSTEM
 07611N 09/99 STEEL STANDING SEAM ROOFING
 07612N 09/99 ALUMINUM STANDING SEAM ROOFING
 07620a 08/99 MESH TERMITE BARRIER
 07625a 05/01 COPPER SHEET METAL FLASHING
 07720A 04/00 ROOF VENTILATORS, GRAVITY-TYPE
 07810N 09/99 SPRAY-APPLIED FIREPROOFING
 07810a 07/01 SPRAY-APPLIED FIREPROOFING
 07840N 09/99 FIRESTOPPING
 07840a 08/00 FIRESTOPPING
 07900a 06/97 JOINT SEALING
 07920N 09/99 JOINT SEALANTS

DIVISION 08 - DOORS & WINDOWS

08110 05/01 STEEL DOORS AND FRAMES
 08120 09/99 ALUMINUM DOORS AND FRAMES
 08161 08/01 ALUMINUM SLIDING GLASS DOORS
 08162 08/01 SLIDING FIRE DOORS
 08165a 11/01 SLIDING METAL DOORS
 08181 08/01 METAL STORM DOORS
 08210 09/99 WOOD DOORS
 08302N 08/01 CORROSION CONTROL HANGAR DOORS
 08315N 09/01 BLAST RESISTANT DOORS (OVAL ARCH MAGAZINES)
 08330a 06/97 OVERHEAD ROLLING DOORS
 08331N 08/01 ROLLING SERVICE [AND FIRE] DOORS
 08331a 09/98 METAL ROLLING COUNTER DOORS
 08342 03/01 STEEL SLIDING HANGAR DOORS
 08361 08/01 SECTIONAL OVERHEAD DOORS
 08370 08/01 VERTICAL LIFT DOORS
 08390 04/01 BLAST RESISTANT DOORS
 08510 08/01 STEEL WINDOWS
 08520N 08/01 ALUMINUM WINDOWS
 08520a 03/00 ALUMINUM AND ENVIRONMENTAL CONTROL ALUMINUM WINDOWS
 08550 08/01 WOOD WINDOWS
 08560 08/01 PLASTIC WINDOWS
 08581 08/01 BLAST RESISTANT TEMPERED GLASS WINDOWS
 08582 08/01 ALUMINUM STORM WINDOWS
 08590 08/97 WOOD WINDOWS - REPAIR AND REHABILITATION
 08600 08/00 SKYLIGHTS
 08710 08/01 DOOR HARDWARE
 08745 08/01 ELECTRICAL LOCKING CONTROL FOR BRIGS
 08800N 09/99 GLAZING
 08810a 05/97 GLASS AND GLAZING
 08840a 07/95 PLASTIC GLAZING
 08850 07/92 FRAGMENT RETENTION FILM FOR GLASS
 08900 09/99 GLAZED CURTAIN WALL

DIVISION 09 - FINISHES

09100N 09/99 METAL SUPPORT ASSEMBLIES
 09200a 06/97 LATHING AND PLASTERING
 09205N 09/99 FURRING AND LATHING
 09212N 09/00 GYPSUM PLASTER, CEMENT PLASTER, AND STUCCO

09215N 09/99 VENEER PLASTER
 09215a 11/95 VENEER PLASTER
 09225A 11/95 STUCCO
 09250A 04/01 GYPSUM WALLBOARD
 09250N 09/01 GYPSUM BOARD
 09310A 11/01 CERAMIC TILE
 09310N 09/99 CERAMIC TILE, QUARRY TILE, AND PAVER TILE
 09331N 09/99 CHEMICAL-RESISTANT QUARRY TILE
 09410N 09/99 PORTLAND CEMENT TERRAZZO
 09411A 01/96 BONDED TERRAZZO
 09421A 11/95 TERRAZZO TILE
 09445A 01/96 RESINOUS TERRAZZO FLOORING
 09510A 10/01 ACOUSTICAL CEILINGS
 09510N 09/99 ACOUSTICAL CEILINGS
 09611N 03/01 THIN FILM FLOORING SYSTEM FOR AIRCRAFT MAINTENANCE FACILITIES
 09612N 03/01 EPOXY MORTAR FLOORING SYSTEM FOR AIRCRAFT MAINTENANCE
 FACILITIES
 09620A 01/98 RESILIENT ATHLETIC FLOORING
 09640A 11/01 WOOD STRIP FLOORING
 09641A 04/01 HARDWOOD PARQUET FLOORING
 09641N 08/01 WOOD ATHLETIC FLOORING
 09643N 08/01 PORTABLE (DEMOUNTABLE) WOOD FLOORING
 09645N 08/01 WOOD PARQUET FLOORING
 09650A 07/96 RESILIENT FLOORING
 09651N 08/01 RESILIENT TILE FLOORING
 09655N 08/01 RESILIENT SHEET FLOORING
 09656N 08/01 RESILIENT SHEET FLOORING (INSTITUTIONAL)
 09660A 01/98 CONDUCTIVE VINYL FLOORING
 09670A 04/01 INDUSTRIAL RESIN-BASED FLOORING
 09670N 08/01 FLUID-APPLIED FLOORING
 09680A 05/01 CARPET
 09680N 08/01 CARPET
 09685N 08/01 CARPET TILE
 09720A 04/01 WALLCOVERINGS
 09721N 08/01 VINYL COATED FABRIC WALL COVERING
 09840A 11/01 ACOUSTICAL WALL TREATMENT
 09900 09/01 PAINTS AND COATINGS
 09910N 03/00 MAINTENANCE, REPAIR, AND COATING OF TALL ANTENNA TOWERS
 09915 06/93 COLOR SCHEDULE
 09963N 09/99 HIGH-BUILD GLAZE COATINGS
 09965A 04/01 PAINTING: HYDRAULIC STRUCTURES
 09965N 08/01 METALLIC TYPE CONDUCTIVE/SPARK RESISTANT CONCRETE FLOOR FINISH
 09967N 09/99 COATING OF STEEL WATERFRONT STRUCTURES
 09970N 09/01 INTERIOR COATING OF WELDED STEEL PETROLEUM FUEL TANKS
 09971 09/01 EXTERIOR COATING OF STEEL STRUCTURES
 09971A 10/00 METALLIZING: HYDRAULIC STRUCTURES
 09972 09/01 INTERIOR COATING OF WELDED STEEL WATER TANKS
 09973 09/01 INTERIOR COATING OF WELDED STEEL PETROLEUM FUEL TANKS
 09974N 09/00 PROTECTION OF BURIED STEEL PIPING AND STEEL BULKHEAD TIE RODS
 09980N 09/99 INTERIOR LINING FOR CONCRETE STORAGE TANKS (FOR PETROLEUM
 FUELS)
 09981N 09/98 LINSEED OIL PROTECTION OF CONCRETE SURFACES
 09995 01/98 PREPARATION OF HISTORIC WOOD AND METAL SURFACES FOR PAINTING

DIVISION 10 - SPECIALTIES

10100A 11/00 VISUAL COMMUNICATIONS SPECIALTIES
 10153N 09/99 TOILET PARTITIONS
 10160A 07/98 TOILET PARTITIONS

10191N 08/01 CUBICLE TRACK AND HARDWARE
 10201N 09/99 METAL [WALL] [AND] [DOOR] LOUVERS
 10260A 12/95 WALL AND CORNER PROTECTION
 10260N 09/99 WALL AND CORNER GUARDS
 10270A 01/97 RAISED FLOOR SYSTEM
 10270N 09/99 ACCESS FLOORING
 10400N 09/99 IDENTIFICATION DEVICES
 10430A 06/01 EXTERIOR SIGNAGE
 10440A 06/01 INTERIOR SIGNAGE
 10505N 09/99 STEEL CLOTHING LOCKERS
 10605N 09/99 WIRE MESH PARTITIONS
 10615A 08/00 DEMOUNTABLE PARTITIONS
 10650A 08/00 OPERABLE PARTITIONS
 10652N 08/01 OPERABLE PANEL PARTITIONS
 10655N 08/01 ACCORDION FOLDING PARTITIONS
 10675N 09/99 STEEL SHELVING
 10716N 08/01 STORM SHUTTERS
 10800A 04/01 TOILET ACCESSORIES
 10800N 09/99 TOILET AND BATH ACCESSORIES

DIVISION 11 - EQUIPMENT

11020A 12/97 SECURITY VAULT DOOR
 11020N 09/99 SECURITY VAULT DOOR [AND DAY GATE]
 11022A 12/88 DOORS; FIRE-INSULATED, RECORD-VAULT
 11025 08/01 FORCED ENTRY RESISTANT COMPONENTS
 11035 04/00 BULLET-RESISTANT COMPONENTS
 11145A 04/01 AVIATION FUELING SYSTEMS
 11161N 09/99 DOCK LEVELERS
 11162A 08/00 LOADING DOCK LEVELER
 11171N 08/01 PACKAGED INCINERATORS
 11181A 02/90 INCINERATORS, GENERAL PURPOSE
 11182A 08/01 INCINERATORS, MEDICAL WASTE
 11191 09/99 DETENTION AND SECURITY WINDOWS
 11192 09/99 DETENTION AND SECURITY GLAZING
 11193 09/99 DETENTION HOLLOW METAL FRAMES, DOORS, AND DOOR FRAMES
 11194 08/01 DETENTION HARDWARE
 11195 09/99 DETENTION FURNITURE AND ACCESSORIES
 11211A 12/88 PUMPS: WATER, CENTRIFUGAL
 11212A 03/89 PUMPS: WATER, VERTICAL TURBINE
 11215A 06/01 FANS/BLOWERS/PUMPS; OFF-GAS
 11220A 09/97 PRECIPITATION/COAGULATION/FLOCCULATION WATER TREATMENT
 11225A 06/01 DOWNFLOW LIQUID ACTIVATED CARBON ADSORPTION UNITS
 11226A 04/98 VAPOR PHASE ACTIVATED CARBON ADSORPTION UNITS
 11241A 12/88 CHLORINE-FEEDING MACHINES (AUTOMATIC, SEMIAUTOMATIC AND MANUAL)
 11242A 6/97 CHEMICAL FEED SYSTEMS
 11243A 04/99 CHEMICAL TREATMENT OF WATER FOR MECHANICAL SYSTEMS
 11250A 11/01 WATER SOFTENERS, CATION-EXCHANGE (SODIUM CYCLE)
 11285A 01/94 MITER GATES
 11286A 01/94 SECTOR GATES
 11287A 01/94 TAINTER GATES AND ANCHORAGES
 11288A 07/93 VERTICAL LIFT GATES
 11289A 04/93 CLOSURE GATES
 11301A 04/99 AIR STRIPPER
 11310A 11/90 PUMPS; SEWAGE AND SLUDGE
 11311N 08/01 PARALLEL PLATE [OR VERTICAL TUBE], GRAVITY OIL-WATER SEPARATOR
 11312A 04/98 SIPHONS, DOSING
 11312N 01/01 PACKAGE [GRINDER PUMP][LIFT] STATION
 11313A 04/01 PNEUMATIC SEWAGE EJECTORS

11320N 08/01 GRIT COLLECTING EQUIPMENT
 11330A 04/89 SEWAGE BAR SCREEN AND MECHANICAL SHREDDER
 11331N 08/01 COMMINUTOR
 11334A 01/89 COMMINUTOR
 11338N 08/01 CIRCULAR CLARIFIER
 11350A 07/01 SLUDGE-COLLECTING EQUIPMENT
 11360A 06/01 RECESSED CHAMBER FILTER PRESS SYSTEM
 11365A 06/90 TRICKLING FILTER
 11375A 11/01 AIR SUPPLY AND DIFFUSION EQUIPMENT FOR SEWAGE TREATMENT
 11375N 08/01 AERATION EQUIPMENT
 11376 03/93 ULTRAVIOLET DISINFECTION EQUIPMENT
 11377 06/01 ADVANCED OXIDATION PROCESSES (AOP)
 11378 10/01 THERMAL (CATALYTIC) OXIDATION SYSTEMS
 11380 12/89 SLUDGE-DIGESTER GAS, HEATING, AND MIXING SYSTEM
 11390 08/01 PREFABRICATED BIOCHEMICAL WASTEWATER TREATMENT PLANT
 11391 08/01 CONTINUOUS LOOP REACTOR WASTEWATER TREATMENT SYSTEM
 11393 06/01 FILTRATION SYSTEM
 11400A 11/01 FOOD SERVICE EQUIPMENT
 11400N 09/99 FOOD SERVICE EQUIPMENT
 11401N 08/01 ELECTRIC KITCHEN EQUIPMENT
 11475 08/01 RADIOGRAPHIC DARKROOM EQUIPMENT
 11500A 05/01 AIR POLLUTION CONTROL
 11601N 08/01 LABORATORY EQUIPMENT AND FUMEHOODS
 11613N 08/01 STILLs AND ASSOCIATED EQUIPMENT
 11700N 08/01 GENERAL REQUIREMENTS FOR MEDICAL AND DENTAL EQUIPMENT
 11702N 08/01 MEDICAL EQUIPMENT, MISCELLANEOUS
 11704N 09/99 [CASEWORK] [AND] [MATERIAL HANDLING UNITS] IN MEDICAL FACILITIES
 11706N 09/99 HYDROTHERAPY EQUIPMENT
 11707N 08/01 HOSPITAL AND LABORATORY WASHING EQUIPMENT
 11708N 09/99 INSTALLATION OF GOVERNMENT-FURNISHED MEDICAL EQUIPMENT
 11710A 07/01 WARMING CABINETS, STERILIZERS, AND ASSOCIATED EQUIPMENT
 11712N 08/01 STERILIZERS AND ASSOCIATED EQUIPMENT
 11744N 09/99 DENTAL EQUIPMENT

DIVISION 12 - FURNISHINGS

12301N 09/99 MANUFACTURED VANITIES
 12302N 09/99 WARDROBE STORAGE CABINETS (THREE DRAWER)
 12303N 09/99 WARDROBES
 12320A 05/98 CABINETS AND COUNTERTOPS
 12350A 04/99 CASEWORK FOR MEDICAL AND DENTAL FACILITIES
 12351N 03/01 MEDICAL AND DENTAL CASEWORK
 12352N 09/99 RESIDENTIAL CASEWORK
 12490A 01/98 WINDOW TREATMENT
 12490N 09/99 BLINDS, VENETIAN (AND AUDIO VISUAL)
 12491N 08/01 CURTAINS AND DRAPES
 12600A 01/98 THEATER CHAIRS
 12601N 09/99 THEATER SEATING
 12705 06/01 FURNITURE SYSTEMS

DIVISION 13 - SPECIAL CONSTRUCTION

13034N 08/01 PREFABRICATED AUDIOMETRIC ROOMS
 13038 08/01 COLD-STORAGE ROOMS (PREFABRICATED PANEL TYPE)
 13080 04/99 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT
 13090A 01/94 X-RAY SHIELDING
 13092N 09/99 X-RAY SHIELDING
 13093N 08/01 RADIO FREQUENCY SHIELDED ENCLOSURES, DEMOUNTABLE TYPE

13094N 08/01 RADIO FREQUENCY SHIELDED ENCLOSURES, WELDED TYPE
 13095A 07/01 ELECTROMAGNETIC (EM) SHIELDING
 13095N 09/99 HEMP SHIELDED DOOR
 13100A 07/01 LIGHTNING PROTECTION SYSTEM
 13100N 09/99 LIGHTNING PROTECTION SYSTEM
 13110A 11/98 CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE)
 13110N 09/00 CATHODIC PROTECTION BY GALVANIC ANODES
 13111A 11/98 CATHODIC PROTECTION SYSTEM (STEEL WATER TANKS)
 13111N 08/01 CATHODIC PROTECTION BY IMPRESSED CURRENT
 13112A 11/98 CATHODIC PROTECTION SYSTEM (IMPRESSED CURRENT)
 13112N 03/00 CATHODIC PROTECTION SYSTEM (STEEL WATER TANKS)
 13113A 09/01 CATHODIC PROTECTION SYSTEMS (IMPRESSED CURRENT) FOR LOCK MITER GATES
 13120A 10/01 STANDARD METAL BUILDING SYSTEMS
 13121A 10/01 METAL BUILDING SYSTEMS (MINOR REQUIREMENTS)
 13121N 08/01 PREENGINEERED METAL BUILDINGS
 13202A 05/97 FUEL STORAGE SYSTEMS
 13203A 08/93 TIGHTNESS TESTING OF UNDERGROUND FUEL SYSTEMS
 13205N 08/01 STEEL TANKS WITH FIXED ROOFS
 13206A 11/88 STEEL STANDPIPES AND GROUND STORAGE RESERVOIRS
 13208N 09/99 WIRE-WOUND CIRCULAR PRESTRESSED-CONCRETE WATER TANK
 13209N 09/00 WATER STORAGE TANKS
 13210A 01/89 ELEVATED STEEL WATER TANK
 13211A 07/89 PRESSURE VESSELS FOR STORAGE OF COMPRESSED GASES
 13216N 09/99 UNDERGROUND PETROLEUM TANKS
 13217N 09/99 FIBERGLASS-PLASTIC LINING FOR STEEL TANK BOTTOMS (FOR PETROLEUM)
 13219N 09/99 CLEANING PETROLEUM STORAGE TANKS
 13234A 04/01 FLOATING COVER FOR SLUDGE-DIGESTION TANKS
 13280A 11/01 ASBESTOS ABATEMENT
 13281A 04/00 LEAD HAZARD CONTROL ACTIVITIES
 13281N 09/00 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS
 13282N 09/99 REMOVAL AND DISPOSAL OF MATERIAL CONTAINING LEAD
 13283N 09/00 REMOVAL AND DISPOSAL OF LEAD-CONTAINING PAINT
 13284N 09/99 REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBs)
 13285N 09/99 REMOVAL AND DISPOSAL OF PCB CONTAMINATED SOILS
 13286N 01/01 HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBs AND MERCURY
 13287N 09/99 RADON MITIGATION
 13290A 03/89 COMPOSTING TOILET
 13401N 09/99 FLOW MEASURING EQUIPMENT [POTABLE WATER] [SEWAGE TREATMENT PLANT]
 13405A 07/01 PROCESS CONTROL
 13420A 11/97 SELF-ACTING BLAST VALVES
 13451A 03/00 POWER MONITORING SYSTEM
 13600A 08/01 SOLAR WATER HEATING EQUIPMENT
 13610N 09/99 SOLAR LIQUID FLAT PLATE COLLECTORS
 13702N 09/99 BASIC INTRUSION DETECTION SYSTEMS (IDS)
 13703N 09/99 COMMERCIAL INTRUSION DETECTION SYSTEMS (IDS)
 13720A 05/98 ELECTRONIC SECURITY SYSTEM
 13721A 03/97 SMALL INTRUSION DETECTION SYSTEM
 13798 09/99 DURESS SIGNAL SYSTEM [FOR BRIG FACILITIES]
 13799 09/99 WATCHTOUR SYSTEM [FOR BRIG FACILITIES]
 13801A 10/99 UTILITY MONITORING AND CONTROL SYSTEM (UMCS)
 13814A 04/89 BUILDING PREPARATION FOR ENERGY MONITORING AND CONTROL SYSTEMS (EMCS)
 13820A 04/01 MULTI-BUILDING EXPANSION OF ENERGY MONITORING AND CONTROL SYSTEMS
 13850A 08/98 FIRE DETECTION AND ALARM SYSTEM, DIRECT CURRENT LOOP

13851A 08/98 FIRE DETECTION AND ALARM SYSTEM, ADDRESSABLE
 13851N 09/99 EXTERIOR FIRE ALARM SYSTEM, CLOSED CIRCUIT TELEGRAPHIC TYPE
 13852A 11/97 FIRE ALARM REPORTING SYSTEM, RADIO TYPE
 13852N 09/99 INTERIOR FIRE DETECTION AND ALARM SYSTEM
 13853A 11/97 CENTRAL FIRE ALARM SYSTEM, DIGITAL ALARM COMMUNICATOR TYPE
 13853N 09/99 FIRE ALARM SYSTEM, RADIO TYPE
 13854N 08/00 FIRE ALARM REPORTING SYSTEMS - DIGITAL COMMUNICATORS
 13855N 03/00 ANALOG/ADDRESSABLE INTERIOR FIRE ALARM SYSTEM
 13856N 03/00 CARBON MONOXIDE DETECTORS
 13920A 11/99 FIRE PUMPS
 13920N 09/99 FIRE PUMPS
 13930A 11/99 WET PIPE SPRINKLER SYSTEM, FIRE PROTECTION
 13930N 09/99 WET-PIPE FIRE SUPPRESSION SPRINKLERS
 13931N 09/99 FIRE EXTINGUISHING SPRINKLER SYSTEMS (RESIDENTIAL)
 13935A 04/00 DRY PIPE SPRINKLER SYSTEM, FIRE PROTECTION
 13935N 09/99 DRY-PIPE FIRE SPRINKLER SYSTEMS
 13945A 04/00 PREACTION AND DELUGE SPRINKLER SYSTEMS, FIRE PROTECTION
 13945N 09/99 [DELUGE] [PREACTION] FIRE SPRINKLER SYSTEMS
 13955A 03/99 AQUEOUS FILM-FORMING FOAM (AFFF) FIRE PROTECTION SYSTEM
 13956N 09/99 FOAM FIRE EXTINGUISHING FOR AIRCRAFT HANGARS
 13957N 09/99 FOAM FIRE EXTINGUISHING FOR FUEL TANK PROTECTION
 13958N 09/99 FOAM FIRE EXTINGUISHING FOR HAZ/FLAM MATERIAL FACILITY
 13961N 09/99 CARBON DIOXIDE FIRE EXTINGUISHING (HIGH PRESSURE)
 13962N 09/99 CARBON DIOXIDE FIRE EXTINGUISHING (LOW PRESSURE)
 13965A 03/98 WET CHEMICAL FIRE EXTINGUISHING SYSTEM
 13966N 09/00 HALON 1301 FIRE EXTINGUISHING
 13971N 09/00 WET CHEMICAL FIRE EXTINGUISHING FOR KITCHEN CABINET
 13975N 02/01 STANDPIPE SYSTEMS

DIVISION 14 - CONVEYING SYSTEMS

14210A 08/01 ELEVATORS, ELECTRIC
 14210N 03/01 ELECTRIC TRACTION ELEVATORS
 14211A 01/94 ELEVATORS, ELECTRIC, FOR CIVIL WORKS
 14240A 08/01 ELEVATORS, HYDRAULIC
 14240N 03/01 HYDRAULIC ELEVATORS
 14534N 09/99 MONORAILS WITH MANUAL HOIST
 14535N 09/99 MONORAILS WITH AIR MOTOR POWERED HOIST
 14580A 08/01 PNEUMATIC-TUBE SYSTEM
 14601A 04/94 CRANES, BRIDGE & GANTRY, TOP RUNNING, 30-TON MAXIMUM CAPACITY
 14602A 08/95 CRANES, SINGLE-GIRDER BRIDGE, MONORAIL AND JIB
 14606N 09/99 PORTAL CRANE TRACK INSTALLATION
 14622N 09/99 MONORAILS WITH ELECTRIC POWERED HOISTS
 14630A 05/93 OVERHEAD ELECTRIC CRANES
 14636N 09/99 CRANES, OVERHEAD ELECTRIC, TOP RUNNING (UNDER 20,000 POUNDS)
 14637N 09/99 CRANES, OVERHEAD ELECTRIC, UNDERRUNNING (UNDER 20,000 POUNDS)

DIVISION 15 - MECHANICAL

15005A 11/92 SPEED REDUCERS FOR STORM WATER PUMPS
 15010A 04/92 HYDRAULIC POWER SYSTEMS FOR CIVIL WORKS STRUCTURES
 15050N 09/01 BASIC MECHANICAL MATERIALS AND METHODS
 15070A 11/01 SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT
 15070N 09/99 MECHANICAL SOUND, VIBRATION, AND SEISMIC CONTROL
 15080A 04/01 THERMAL INSULATION FOR MECHANICAL SYSTEMS
 15080N 09/99 MECHANICAL INSULATION
 15081N 09/99 EXTERIOR PIPING INSULATION
 15131A 05/99 VERTICAL PUMPS, AXIAL-FLOW AND MIXED-FLOW IMPELLER-TYPE
 15132A 08/96 SUBMERSIBLE PUMP, AXIAL-FLOW AND MIXED-FLOW TYPE

15133A 01/97 DIESEL/NATURAL GAS FUELED ENGINE PUMP DRIVES
 15181A 01/01 CHILLED AND CONDENSER WATER PIPING AND ACCESSORIES
 15181N 09/99 CHILLED, CONDENSER, OR DUAL SERVICE WATER PIPING
 15182A 01/01 REFRIGERANT PIPING
 15182N 09/99 REFRIGERANT PIPING
 15183N 09/99 STEAM SYSTEM AND TERMINAL UNITS
 15184N 09/99 [HIGH][MEDIUM] TEMPERATURE WATER SYSTEM WITHIN BUILDINGS
 15185N 09/99 LOW TEMPERATURE WATER [LTW] HEATING SYSTEM
 15190A 02/99 GAS PIPING SYSTEMS
 15191N 09/99 FIBERGLASS REINFORCED PLASTIC (FRP) PIPING (FOR PETROLEUM)
 15192N 09/99 FUEL OIL PIPING
 15193N 09/99 GASOLINE/DIESEL DISPENSING SYSTEMS
 15194N 10/01 AVIATION FUEL DISTRIBUTION AND DISPENSING
 15195N 09/99 NATURAL GAS AND LIQUID PETROLEUM PIPING
 15200A 05/01 PIPELINES, LIQUID PROCESS PIPING
 15211N 09/99 LOW PRESSURE COMPRESSED AIR PIPING (NON-BREATHING AIR TYPE)
 15212N 09/99 HIGH AND MEDIUM PRESSURE COMPRESSED AIR PIPING
 15213N 09/99 LARGE CENTRIFUGAL AIR COMPRESSORS (OVER 200 HP)
 15214N 09/99 LARGE NONLUBRICATED RECIPROCATING AIR COMPRESSORS (OVER 300 HP)
 15215N 09/99 NONLUBRICATED ROTARY SCREW AIR COMPRESSORS (100 HP AND LARGER)
 15216N 09/99 WELDING PRESSURE PIPING
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ATTACHMENT NO. 4

UNEDITED GUIDE SPECIFICATIONS - OMAHA DISTRICT

The following unedited Omaha District guide specifications are attached. Copies of these sections will be furnished to the successful Contractor (in Specsintact software), after Contract Award.

01356	STORM WATER POLLUTION PREVENTION MEASURES
01565	NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES
02210	GRADING
02440	PAVEMENT MARKINGS
02560	(COLORADO) PAVEMENTS FOR SMALL PROJECTS

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SECTION 01356

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06/01

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SECTION 01356

STORM WATER POLLUTION PREVENTION MEASURES
06/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 448 (1998) Sizes of Aggregate for Road and Bridge Construction

ASTM D 4873 (1995) Identification, Storage, and Handling of Geosynthetic Rolls

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 288 (1997) Geotextile for Highway Applications

1.2 GENERAL

[The Contractor shall implement the storm water pollution prevention measures specified in this section in a manner which will meet the requirements of Section 01355 ENVIRONMENTAL PROTECTION, and the requirements of the National Pollution Discharge Elimination System (NPDES) permit specified in Section 01565 NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES.] [The Contractor shall install and maintain stabilization and structural best management practices which will minimize erosion and sediment pollution from the construction site to the extent attainable. The Contractor shall be responsible for selection of appropriate best management practices as specified herein.]

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-07 Certificates

Mill Certificate or Affidavit

1.4 EROSION AND SEDIMENT CONTROLS

The controls and measures required by the Contractor are described [in the Storm Water Pollution Prevention Plans (SWPPP) attached to Section 01556 NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION

SITES][below].

1.4.1 Stabilization Practices

The stabilization practices to be implemented may include temporary seeding, mulching, sod stabilization, vegetative buffer strips, erosion control blankets, [protection of trees,] preservation of mature vegetation, etc. On his daily CQC Report, the Contractor shall record the dates when the major grading activities occur; when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated.

1.4.1.1 Permanent Seeding

Disturbed areas of the site where construction activities permanently ceases shall be stabilized with permanent seeding no more than 14 days after the construction activity ceases, except as follows. When the initiation of permanent seeding is stopped due to snow cover or arid conditions, permanent seeding shall be initiated as soon as practicable.

1.4.1.2 Temporary Seeding and Mulching

Areas where construction activities will temporarily cease for more than one year shall be temporarily seeded and mulched. Disturbed areas of the site where construction activities temporarily cease for more than 21 days and less than one year shall be stabilized with either temporary seeding and mulching or mulching not more than 14 days after construction activity ceases, except as follows. When the initiation of temporary stabilization measures is stopped due to snow cover or arid conditions, stabilization measures shall be initiated as soon as practicable.

1.4.1.3 Erosion Control Blankets

Erosion control blanket may be installed on steep slopes and in drainage swales and ditches to protect finished grades from erosion.

1.4.2 Temporary Structural Practices

Temporary structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Temporary structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Temporary structural practices shall include but not be limited to the following devices. [Location and details of installation and construction are shown on the drawings.]

1.4.2.1 Silt Fences

The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Silt fence barriers shall be installed along the down slope boundary of all disturbed areas prior to beginning land-disturbing activities in those areas. Silt fence barriers may be installed across ditches or swales but not where the drainage area is greater than 1 acre. Removal of silt fence barriers shall be approved by the Contracting Officer.

1.4.2.2 Storm Drain Inlet Protection

Storm drain inlet protection shall be installed at each new and existing inlet which receives storm runoff from disturbed areas of 1 acre or less. The protection at each inlet shall be removed once the disturbed area has been finally stabilized.

1.4.2.3 Culvert Inlet Protection

Culvert inlet protection shall be installed at all culverts with a drainage area of 1 acre or less.

1.4.2.4 Rock Check Dams

Rock check dams may be used to reduce erosion of temporary or permanent ditches or swales. Type 1 rock check dams shall be used when the upstream drainage area is less than 2 acres. Type 2 rock check dams shall be used when the upstream area is 2 to 10 acres.

1.4.2.5 Stone Construction Entrance

A stone construction entrance shall be constructed wherever traffic will be leaving the construction site and move directly onto a paved road. Stone construction entrances shall be removed after the site has been finally stabilized.

1.4.2.6 Sediment Trap

Sediment traps may be constructed below disturbed areas where the total contributing drainage area is less than 3 acres. Sediment traps, when used, should be constructed prior to disturbance of upslope areas. Sediment traps must have an initial storage volume of 134 cubic yards per acre of drainage area, half of which shall be in the form of a permanent pool or wet storage to provide a stable settling medium. The remaining half shall be in the form of a drawdown or dry storage which will provide extended settling time during less frequent, larger storm events.

1.4.2.7 Diversion Dikes

Diversion dikes may be constructed to divert runoff from upslope drainage areas away from unprotected disturbed areas and slopes to a stabilized outlet or to divert sediment-laden runoff from a disturbed area to a sediment-trapping facility such as a sediment trap or sediment basin. Diversion dikes shall have a maximum channel slope of 2 percent and shall be adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 18 inches. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. The Contractor shall ensure that the diversion dikes are not damaged by construction operations or traffic.

PART 2 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES

2.1.1 Geotextile

The geotextile shall comply with the requirements of AASHTO M 288 for temporary silt fence.

2.1.2 Silt Fence Stakes and Posts

The Contractor may use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 2 inches by 2 inches when oak is used and 4 inches by 4 inches when pine is used, and shall have a minimum length of 3 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 5 feet.

2.1.3 Mill Certificate or Affidavit

A mill certificate or affidavit shall be provided attesting that the geotextile and factory seams meet chemical, physical, and manufacturing requirements specified above. The mill certificate or affidavit shall specify the actual Minimum Average Roll Values and shall identify the fabric supplied by roll identification numbers. The Contractor shall submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the geotextile.

2.1.4 Identification Storage and Handling

Geotextile shall be identified, stored and handled in accordance with ASTM D 4873.

2.1.5 Support Mesh

Support mesh shall be 14-1/2 gage or heavier steel wire with a mesh spacing of 6 by 6 inch or a prefabricated polymeric mesh of equivalent strength.

2.2 Erosion Control Blankets

Erosion control blankets shall be a machine-produced mat with a biodegradable agricultural straw matrix (approximately 0.50 lb/sq yd) and photodegradable netting on each side. The blanket shall be sewn together with degradable thread. Installation staple patterns shall be clearly marked on the erosion control blanket with environmentally safe paint.

2.3 COMPONENTS FOR SEDIMENT TRAP

Coarse aggregate shall conform to ASTM D 448, Size 3, 357, or 5. Minor variations from the gradations specified will be permitted. Stone for riprap shall consist of field stone or rough unhewn quarry stone of approximately rectangular shape. The stone shall be hard and angular and of such quality that it will not disintegrate on exposure to water or weathering. The specific gravity of individual stones shall be at least 2.5. Riprap stones shall weigh between 50 and 150 pounds each, except that approximately 10 percent may weigh 50 pounds or less. At least 60 percent shall weight more than 100 pounds. Geotextile shall conform to paragraph GEOTEXTILES.

2.4 COMPONENTS FOR INLET PROTECTION

Aggregates for gravel filter should be sized to get the greatest amount of filtering action possible (by using smaller-sized stone), while not creating significant ponding problems.

2.5 STONE CONSTRUCTION ENTRANCE

Aggregate for construction entrance shall conform to ASTM D 448, Size 1. Minor variations from the gradation specified will be permitted. Geotextile shall conform to paragraph GEOTEXTILES.

2.6 ROCK CHECK DAMS

Coarse aggregate shall conform to ASTM D 448 size number 1 or approved equal. Riprap shall consist of field stone or rough unhewn quarry stone of approximately rectangular shape. Riprap shall be hard and angular. The specific gravity of individual stones shall be at least 2.5. Concrete rubble may be used provided it has a density of at least 150 pcf. Individual stones shall have a weight of 50 to 150 lbs except that a maximum of 10 percent of stone may weigh less than 50 lbs. At least 60 percent of stones shall weigh more than 100 lbs.

2.7 GEOTEXTILES

Geotextile for other than silt fence shall comply with the requirements of AASHTO M 288 for a separation geotextile.

PART 3 EXECUTION

3.1 INSTALLATION OF SILT FENCES

Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6 inch overlap, and securely sealed. A trench shall be excavated approximately 6 inches wide and 8 inches deep on the upslope side of the location of the silt fence. The 6-inch by 8-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the Contracting Officer.

3.2 Sediment Trap

The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and root mat. Fill material for the embankment shall be placed in accordance with Section 02300 EARTHWORK. A geotextile shall be placed between the riprap and subgrade.

3.3 Stone Construction Entrance

The area of the entrance shall be cleared of all vegetation, roots, and other objectionable material. The aggregate layer shall have a minimum total thickness of 6 inches. A geotextile shall be placed beneath aggregate for the full width and length of the entrance. A minimum of 3 inches of the aggregate shall be placed in a cut section to provide stability and secure the geotextile. If conditions on the site are such that the majority of the mud is not removed by the vehicles traveling over the stone, then the tires of the vehicles shall be washed before entering the road. Wash water must be carried away from the entrance to an approved settling area to remove sediment. A wash rack may also be installed for washing of vehicles.

3.4 MAINTENANCE

The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. [Maintenance of protective measures shall conform to the requirements in the SWPPP.] [The following procedures shall be followed to maintain the protective measures.]

3.4.1 Silt Fences

Silt fences shall be inspected in accordance with paragraph INSPECTIONS. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with UFGS Section 02921A SEEDING.

3.4.2 Storm Drain Inlet Protection

Inlet protection structures shall be inspected after each rainfall and repairs made as needed. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design depth.

3.4.3 Rock Check Dams

Check dams should be checked for sediment after each runoff-producing storm event. Sediment should be removed when it reaches one half the original height of the measure.

3.4.4 Stone Construction Entrance

Stone construction entrances shall be maintained in a condition which will prevent tracking or flow of mud onto paved roads. This may require periodic top dressing with additional stone or the washing and reworking of existing stone as conditions demand and repair and/or cleanout of any structures used to trap sediment. The use of water trucks to remove materials dropped, washed, or tracked onto roadways will not be permitted under any circumstances.

3.4.5 Sediment Traps

Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design volume of the wet storage. Filter stone shall be regularly checked to ensure that filtration performance is maintained. Stone choked with sediment shall be removed and cleaned or replaced. The structure should be inspected regularly to ensure that it is structurally sound and has not been damaged by erosion or construction equipment. The height of the stone outlet should be inspected to ensure that its center is at least 1 foot below the top of the embankment.

3.4.6 Diversion Dikes

Diversion dikes shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged diversion dikes and necessary repairs shall be accomplished promptly. When diversion dikes are no longer required, they shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with UFGS Section 02921A SEEDING.

3.5 INSPECTIONS

3.5.1 General

The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every seven (7) calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Where sites have been finally stabilized, such inspection shall be conducted at least once every month. [Inspection of protective measures shall conform to the requirements in the SWPPP.]

3.5.2 Inspections Details

Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

3.5.3 Inspection Reports

For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention measures, maintenance performed, and actions taken. The report shall be furnished to the Contracting Officer within 24 hours of the inspection as a part of the Contractor's daily CQC REPORT.

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SECTION 01565

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03/01

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SECTION 01565

(FEDERAL FACILITIES COLORADO) NPDES PERMIT REQUIREMENTS
FOR STORM WATER DISCHARGES
FROM CONSTRUCTION SITES
03/01

Attachments: Endangered Species/Critical Habitat Letter of Determination
Storm Water General Permit For Construction Activities
Notice of Intent
Notice of Termination

PART 1 GENERAL

1.1 REFERENCES (Not Applicable)

1.2 SUBMITTALS (Not Applicable)

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall be responsible for implementing the terms and requirements of the attached Storm Water General Permit For Construction Activities (Permit No. COR10*##F) as specified below. The Government and the Contractor shall be considered co-permittees. The Government has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications. The Contractor shall have day-to-day operational control of those activities which are necessary to ensure compliance with the requirements specified herein. The Government shall be responsible for all submissions to the EPA. The Government shall retain the official copy of all documents pertaining to compliance with the permit during construction. The project site is not located in designated critical habitat and there are no known "listed species" located in the project area.

3.2 IMPLEMENTATION

3.2.1 Notice of Intent

The Contractor shall complete and sign a Notice of Intent (NOI) in accordance with NPDES Permit No. COR10*##F. The Contractor's NOI shall be furnished to the Contracting Officer at least 7 calendar days prior to the commencement of construction activities. The Government shall submit the Contractor's and Government's NOI's to the EPA. The Government will not submit the NOI's to the EPA until the Storm Water Pollution Prevention Plan has been accepted. The Contractor may not begin land disturbance activities until authorized by the Contracting Officer. The Status of Owner/Operator shall be "F" for both the Contractor and the Government. The Contractor shall check the box marked (d) concerning eligibility with regard to protection of endangered species.

3.2.2 Storm Water Pollution Prevention Plan

3.2.2.1 General

The Contractor shall be responsible for preparing the Storm Water Pollution Prevention Plan (SWPPP). The Contractor shall be responsible for implementing, maintaining and updating the SWPPP (including Site Map) during construction. Unless otherwise indicated, the Contractor shall be responsible for implementing all measures described in the SWPPP. The Contractor shall maintain the following records and attach to the SWPPP: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated. The Government shall keep the official plan at the site. The SWPPP shall be signed by the Government and the Contractor. If major changes to the SWPPP are required during construction, the SWPPP shall be recertified by the Government and the Contractor.

3.2.2.2 Acceptance of SWPPP

Acceptance of the SWPPP is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes to the SWPPP if the Contracting Officer determines that environmental protection requirements are not being met.

3.2.2.3 Notification of Changes

After acceptance of the SWPPP, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.2.3 Posting Notice

The Contractor shall indicate the NPDES permit number, name and telephone number of a local contact person, and a brief description of the project near the main entrance of the construction site in accordance with Part IV.B.2 of the general permit.

3.2.4 Inspections and Reporting

The Contractor shall be responsible for all inspections specified in the SWPPP and the general permit. The Contractor shall also prepare and sign all reports summarizing the inspections as required by the SWPPP and the general permit. Copies of inspection reports shall be furnished to the Contracting Officer for attachment to the SWPPP no more than 2 days after each inspection. The Contractor shall notify the Contracting Officer within 24 hours if an inspection identifies any incidents of non-compliance with the SWPPP and the general permit.

3.2.5 Maintenance

The Contractor shall be responsible for maintaining all erosion and sediment control measures and other protective measures identified in the SWPPP in an effective operating condition. The Government reserves the right to require the Contractor to perform maintenance on erosion and sediment control measures and other protective measures if the Contracting Officer determines that environmental protection requirements are not being met.

3.2.6 Notice of Termination

The Contractor shall notify the Contracting Officer within 24 hours after final stabilization on all portions of the site has been achieved in accordance with Part I.D.2. of the permit. The Contractor shall complete and sign a Notice of Termination (NOT) in accordance with NPDES Permit No. COR10*##F. The Contractor's NOT shall be furnished to the Contracting Officer within 5 calendar days after final stabilization (as defined in the permit) has been achieved on all portions of the site. The Government shall submit the Contractor's and Government's NOTs to the EPA.

3.2.7 Retention of Records

The Government shall be responsible for retaining copies of the SWPPP and all reports in accordance with NPDES Permit No. COR10*##F.

3.2.8 Continuation of Expired Permit

If the current NPDES general permit expires prior to completion of construction, the Contractor shall comply with the conditions of the new permit.

-- End of Section --

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18TH STREET, SUITE 500
DENVER, COLORADO 80202-2466

STORM WATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITIES

For Federal Facilities in the State of Colorado, except those located on Indian Country Lands

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et seq.), except as provided in Part I.B.3 of this permit, operators of construction activities located in an area specified in Part I.A. and who submit a Notice of Intent in accordance with Part II, are authorized to discharge pollutants to waters of the United States in accordance with the conditions and requirements set forth herein.

This permit shall become effective on February 17, 1998

This permit and the authorization to discharge shall expire at midnight, February 17, 2003

Signed and issued this 15th day of January, 1998


Authorized Permitting Official

Kerrigan G. Clough, Assistant Regional Administrator
Office of Pollution Prevention, State and Tribal Assistance
Title

NOTE-THIS PAGE WILL BE REPLACED BY COPY OF SIGNED PAGE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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**NPDES GENERAL PERMIT FOR STORM WATER
DISCHARGES FROM CONSTRUCTION ACTIVITIES**

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Preface

EPA's reissued construction general permits (CGP) were published in the Federal Register on February 17, 1998 (see 63 FR 7857). That document included the conditions for 38 separate permits involving 7 different Regions of EPA. Seven of those permits involve EPA Region VIII and this permit is one of them. In order to make this permit easier to read and understand, it has been reformatted from the style used in the Federal Register and limited to conditions and information that only apply to the area covered by this permit. References, conditions and information pertaining to all other Regions, States and Tribes that were included in the Federal Register, but not applicable to the areas covered by this permit, were removed. The conditions in this permit mimic the permits published in the Federal Register in all other ways. Persons that want CGP information for areas not covered by this permit should refer to the February 17, 1998 Federal Register or one of the other permits prepared by EPA Region VIII.

Part I. COVERAGE UNDER THIS PERMIT

A. Permit Area.

Federal Facilities in the State of Colorado, except those located on Indian Country lands.

B. Eligibility.

1. Permittees are authorized to discharge pollutants in storm water runoff associated with construction activities as defined in 40 CFR 122.26(b)(14)(x) and those construction site discharges designated by the Director as needing a storm water permit under 122.26(a)(1)(v) or under 122.26(a)(9) and 122.26(g)(1)(i). Discharges identified under Part I.B.3 are excluded from coverage. Any discharge authorized by a different NPDES permit may be commingled with discharges authorized by this permit.
2. This permit also authorizes storm water discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided:
 - a. the support activity is directly related to a construction site that is required to have NPDES permit coverage for discharges of storm water associated with construction activity;
 - b. the support activity is not a commercial operation serving multiple unrelated construction projects by different operators, and does not operate beyond the completion of the construction activity at the last construction project it supports; and
 - c. appropriate controls and measures are identified in a storm water pollution prevention plan covering the discharges from the support activity areas.

3. Limitations on Coverage.

- a. Post Construction Discharges. This permit does not authorize storm water discharges that originate from the site after construction activities have been completed and the site, including any temporary support activity site, has undergone final stabilization. Industrial post-construction storm water discharges may need to be covered by a separate NPDES permit.
- b. Discharges Mixed with Non-Storm Water. This permit does not authorize discharges that are mixed with sources of non-storm water, other than those discharges which are identified in Part III.A.2. or 3. (exceptions to prohibition on non-storm water discharges) and are in compliance with Part IV.D.5 (non-storm water discharges).
- c. Discharges Covered by Another Permit. This permit does not authorize storm water discharges associated with construction activity that have been covered under an individual permit or required to obtain coverage under an alternative general permit in accordance with Part VI.L.
- d. Discharges Threatening Water Quality. This permit does not authorize storm water discharges from construction sites that the Director (EPA) determines will cause, or have reasonable potential to cause or contribute to, violations of water quality standards. Where such determinations have been made, the Director may notify the operator(s) that an individual permit application is necessary in accordance with Part VI.L. However, the Director may authorize coverage under this permit after appropriate controls and implementation procedures designed to bring the discharges into compliance with water quality standards have been included in the storm water pollution prevention plan;
- e. Storm water discharges and storm water discharge-related activities that are not protective of Federally listed endangered and threatened ("listed") species or designated critical habitat ("critical habitat").
 - (1) For the purposes of complying with the Part I.B.3.e. eligibility requirements, "storm water discharge-related activities" include:
 - (a) activities which cause, contribute to, or result in point source storm water pollutant discharges, including but not limited to: excavation, site development, grading and other surface disturbance activities; and
 - (b) measures to control storm water including the siting, construction and operation of best management practices (BMPs) to control, reduce or prevent storm water pollution.
 - (2) Coverage under this permit is available only if the applicant certifies that it meets at least one of the criteria in paragraphs (a)-(d) below. Failure to continue to meet one of these criteria during the term of the permit will render a permittee ineligible for coverage under this permit.
 - (a) The storm water discharges and storm water discharge-related activities are not likely to adversely affect listed species or critical habitat; or
 - (b) Formal or informal consultation with the Fish and Wildlife Service and/or the National Marine Fisheries Service (the "Services") under section 7 of the Endangered Species Act (ESA) has been concluded which addresses the effects of the applicant's storm water discharges and storm water discharge-related activities on listed species and critical

3. Limitations on Coverage. (Continued)

habitat and the consultation results in either a no jeopardy opinion or a written concurrence by the Service(s) on a finding that the applicant's storm water discharges and storm water discharge-related activities are not likely to adversely affect listed species or critical habitat. A section 7 consultation may occur in the context of another Federal action (e.g., a ESA section 7 consultation was performed for issuance of a wetlands dredge and fill permit for the project, or as part of a National Environmental Policy Act (NEPA) review); or

- (c) The applicant's construction activities are authorized under section 10 of the ESA and that authorization addresses the effects of the applicant's storm water discharges and storm water discharge-related activities on listed species and critical habitat; or
 - (d) The applicant's storm water discharges and storm water discharge-related activities were already addressed in another operator's certification of eligibility under Part I.B.3.e.(2)(a), (b), or (c) which included the applicant's project area. By certifying eligibility under Part I.B.3.e.(2)(d), the applicant agrees to comply with any measures or controls upon which the other operator's certification under Part I.B.3.e.(2)(a), (b) or (c) was based.
- (3) All applicants must follow the procedures provided at Addendum A of this permit when applying for permit coverage.
 - (4) The applicant must comply with any applicable terms, conditions or other requirements developed in the process of meeting eligibility requirements of Part I.B.3.e.(2)(a), (b), (c), or (d) above to remain eligible for coverage under this permit. Such terms and conditions must be incorporated in the applicant's storm water pollution prevention plan.
 - (5) Applicants who choose to conduct informal consultation to meet the eligibility requirements of Part I.B.3.e.(2)(b) are automatically designated as non-Federal representatives under this permit. See 50 CFR 402.08. Applicants who choose to conduct informal consultation as a non-Federal representatives must notify EPA and the appropriate Service office in writing of that decision.
 - (6) This permit does not authorize any storm water discharges where the discharges or storm water discharge-related activities cause prohibited "take" (as defined under section 3 of the Endangered Species Act and 50 CFR 17.3) of endangered or threatened species unless such takes are authorized under sections 7 or 10 of the Endangered Species Act.
 - (7) This permit does not authorize any storm water discharges where the discharges or storm water discharge-related activities are likely to jeopardize the continued existence of any species that are listed or proposed to be listed as endangered or threatened under the ESA or result in the adverse modification or destruction of habitat that is designated or proposed to be designated as critical under the ESA.
- f. Storm water Discharges and Storm Water Discharge-Related Activities with Unconsidered Adverse Effects on Historic Properties. (Reserved)

C. Obtaining Authorization.

1. In order for storm water discharges from construction activities to be authorized under this general permit, an operator must:
 - a. meet the Part I.B eligibility requirements;
 - b. except as provided in Parts II.A.5 and II.A.6, develop a storm water pollution prevention plan (SWPPP) covering either the entire site or all portions of the site for which they are operators (see definition in Part IX.N) according to the requirements in Part IV. A "joint" SWPPP may be developed and implemented as a cooperative effort where there is more than one operator at a site; and
 - c. submit a Notice of Intent (NOI) in accordance with the requirements of Part II, using an NOI form provided by the Director (or a photocopy thereof, see Addendum C, page 45). Only one NOI need be submitted to cover all of the permittee's activities on the common plan of development or sale (e.g., you do not need to submit a separate NOI for each separate lot in a residential subdivision or for two separate buildings being constructed at a manufacturing facility, provided your SWPPP covers each area for which you are an operator). The SWPPP must be implemented upon commencement of construction activities.
2. Any new operator on site, including those who replace an operator who has previously obtained permit coverage, must submit an NOI to obtain permit coverage.
3. Unless notified by the Director to the contrary, operators who submit a correctly completed NOI in accordance with the requirements of this permit are authorized to discharge storm water from construction activities under the terms and conditions of this permit two (2) days after the date that the NOI is postmarked. The Director may deny coverage under this permit and require submittal of an application for an individual NPDES permit based on a review of the NOI or other information (see Part VI.L).

D. Terminating Coverage.

1. Permittees wishing to terminate coverage under this permit must submit a Notice of Termination (NOT) in accordance with Part VIII of this permit (see Addendum D, page 47). Compliance with this permit is required until an NOT is submitted. The permittee's authorization to discharge under this permit terminates at midnight of the day the NOT is signed.
2. All permittees must submit an NOT within thirty (30) days after one or more of the following conditions have been met:
 - a. final stabilization (see definition Part IX.I) has been achieved on all portions of the site for which the permittee is responsible (including if applicable, returning agricultural land to its pre-construction agricultural use);
 - b. another operator/permittee has assumed control according to Part VI.G.2.c. over all areas of the site that have not been finally stabilized; or

D. Terminating Coverage. (Continued)

- c. for residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

Enforcement actions may be taken if a permittee submits an NOT without meeting one or more of these conditions.

Part II. NOTICE OF INTENT REQUIREMENTS

A. Deadlines for Notification.

1. Except as provided in Parts II.A.3, II.A.4, II.A.5 or II.A.6 below, parties defined as operators (see definition in Part IX.N) due to their operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications, must submit a Notice of Intent (NOI) in accordance with the requirements of this Part at least two (2) days prior to the commencement of construction activities (i.e., the initial disturbance of soils associated with clearing, grading, excavation activities, or other construction activities).
2. Except as provided in Parts II.A.3, II.A.4, II.A.5 or II.A.6 below, parties defined as operators (see definition in Part IX.N) due to their day-to-day operational control over activities at a project which are necessary to ensure compliance with a storm water pollution prevention plan or other permit conditions (e.g., general contractor, erosion control contractor) must submit an NOI at least two (2) days prior to commencing work on-site.
3. For storm water discharges from construction projects where the operator changes, including instances where an operator is added after an NOI has been submitted under Parts II.A.1 or II.A.2, the new operator must submit an NOI at least two (2) days before assuming operational control over site specifications or commencing work on-site.
4. Operators are not prohibited from submitting late NOIs. When a late NOI is submitted, authorization is only for discharges that occur after permit coverage is granted. The Agency reserves the right to take appropriate enforcement actions for any unpermitted activities that may have occurred between the time construction commenced and authorization of future discharges is granted (typically 2 days after a complete NOI is submitted).
5. Operators of on-going construction projects as of the effective date of this permit which received authorization to discharge for these projects under the 1992 baseline construction general permit must:
 - a. submit an NOI according to Part II.B. within 90 days of the effective date of this permit. If the permittee is eligible to submit a Notice of Termination (e.g., construction is finished and final stabilization has been achieved) before the 90th day, a new NOI is not required to be submitted;
 - b. for the first 90 days from the effective date of this permit, comply with the terms and conditions of the 1992 baseline construction general permit they were previously authorized under; and
 - c. update their storm water pollution prevention plan to comply with the requirements of Part IV within 90 days after the effective date of this permit.

A. Deadlines for Notification. (Continued)

6. Operators of on-going construction projects as of the effective date of this permit which did **not** receive authorization to discharge for these projects under the 1992 baseline construction general permit must:
 - a. prepare and comply with an interim storm water pollution prevention plan in accordance with the 1992 baseline construction general permit prior to submitting an NOI;
 - b. submit a NOI according to Part II.B; and
 - c. update their storm water pollution prevention plan to comply with the requirements of Part IV within 90 days after the effective date of this permit.

B. Contents of Notice of Intent (NOI).

1. The NOI form shall be signed in accordance with Part VI.G of this permit and shall include the following information:

- a. the name, address, and telephone number of the operator filing the NOI for permit coverage;
- b. an indication of whether the operator is a Federal, State, Tribal, private, or other public entity;

NOTE: All projects on Federal Facilities in Colorado must have an "F" in the Status of Owner/Operator box on the NOI. Even private contracting companies must put an "F" in that box so that we can tell its a Federal Facility project, thus regulated by EPA not the State of Colorado.

- c. the name (or other identifier), address, county, and latitude/longitude of the construction project or site;
- d. an indication of whether the project or site is located on Indian Country lands;
- e. confirmation that a storm water pollution prevention plan (SWPPP) has been developed or will be developed prior to commencing construction activities, and that the SWPPP will be compliant with any applicable local sediment and erosion control plans. Copies of SWPPPs or permits should **not** be included with the NOI submission;
- f. optional information: the location where the SWPPP may be viewed and the name and telephone number of a contact person for scheduling viewing times;
- g. the name of nearest named the receiving water(s);
- h. estimates of project start and completion dates, and estimates of the number of acres of the site on which soil will be disturbed (if less than 1 acre, enter "1");
- i. based on the instructions in Addendum A, whether any listed or proposed threatened or endangered species, or designated critical habitat, are in proximity to the storm water discharges or storm water discharge-related activities to be covered by this permit; and

B. Contents of Notice of Intent (NOI). (Continued)

- j. under which section(s) of Part I.B.3.e. (Endangered Species) the applicant is certifying eligibility.

Note that as of the effective date of this permit, reporting of information relating to the preservation of historic properties has been reserved and is not required at this time. Such reservation in no way relieves applicants or permittees from any otherwise applicable obligations or liabilities related to historic preservation under State, Tribal or local law. After further discussions between EPA and the Advisory Council on Historic Preservation, the Agency may modify the permit. Any such modification may affect future Notice of Intent reporting requirements.

C. Where to Submit.

1. NOIs must be signed in accordance with Part VI.G. and sent to the following address:

Storm Water Notice of Intent (4203)
US EPA
401 M. Street, SW
Washington, D.C. 20460

Part III. SPECIAL CONDITIONS, MANAGEMENT PRACTICES, AND OTHER NON-NUMERIC LIMITATIONS

A. Prohibition on Non-Storm Water Discharges.

1. Except as provided in Parts I.B.2 or 3 and III.A.2 or 3, all discharges covered by this permit shall be composed entirely of storm water associated with construction activity.
2. Discharges of material other than storm water that are in compliance with an NPDES permit (other than this permit) issued for that discharge may be discharged or mixed with discharges authorized by this permit.
3. The following non-storm water discharges from active construction sites are authorized by this permit provided the non-storm water component of the discharge is in compliance with Part IV.D.5 (non-storm water discharges): discharges from fire fighting activities; fire hydrant flushings; waters used to wash vehicles where detergents are not used; water used to control dust in accordance with Part IV.D.2.c.(2); potable water sources including waterline flushings; routine external building wash down which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated ground water or spring water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.

B. Releases in Excess of Reportable Quantities. The discharge of hazardous substances or oil in the storm water discharge(s) from a facility shall be prevented or minimized in accordance with the applicable storm water pollution prevention plan for the facility. This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117 and 40 CFR 302. Where a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR 110, 40 CFR 117 or 40 CFR 302, occurs during a 24 hour period:

1. The permittee is required to notify the National Response Center (NRC) (800-424-8802; in the Washington, DC, metropolitan area call 202-426-2675) in accordance with the requirements of 40 CFR 110, 40 CFR 117 and 40 CFR 302 as soon as he or she has knowledge of the discharge;
2. The storm water pollution prevention plan required under Part IV of this permit must be modified within 14 calendar days of knowledge of the release to: provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, the plan must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the plan must be modified where appropriate.

C. Spills. This permit does not authorize the discharge of hazardous substances or oil resulting from an on-site spill.

D. Discharge Compliance with Water Quality Standards. Operators seeking coverage under this permit shall not be causing or have the reasonable potential to cause or contribute to a violation of a water quality standard. Where a discharge is already authorized under this permit and is later determined to cause or have the reasonable potential to cause or contribute to the violation of an applicable water quality standard, the Director will notify the operator of such violation(s). The permittee shall take all necessary actions to ensure future discharges do not cause or contribute to the violation of a water quality standard and document these actions in the storm water pollution prevention plan. If violations remain or

D. Discharge Compliance with Water Quality Standards. (Continued)

re-occur, then coverage under this permit may be terminated by the Director, and an alternative general permit or individual permit may be issued. Compliance with this requirement does not preclude any enforcement activity as provided by the Clean Water Act for the underlying violation.

E. Responsibilities of Operators. Permittees may meet one or both of the operational control components in the definition of "operator" found in Part IX.N. Either Parts III.E.1 or III.E.2 or both will apply depending on the type of operational control exerted by an individual permittee. Part III.E.3 applies to all permittees.

1. Permittees with operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications (e.g., developer or owner), must:
 - a. ensure the project specifications that they develop meet the minimum requirements of Part IV (Storm Water Pollution Prevention Plans (SWPPP)) and all other applicable conditions;
 - b. ensure that the SWPPP indicates the areas of the project where they have operational control over project specifications (including the ability to make modifications in specifications), and ensure all other permittees implementing portions of the SWPPP impacted by any changes they make to the plan are notified of such modifications in a timely manner; and
 - c. ensure that the SWPPP for portions of the project where they are operators indicates the name and NPDES permit number for parties with day-to-day operational control of those activities necessary to ensure compliance with the SWPPP or other permit conditions. If these parties have not been identified at the time the SWPPP is initially developed, the permittee with operational control over project specifications shall be considered to be the responsible party until such time as the authority is transferred to another party (e.g., general contractor) and the plan updated.
2. Permittee(s) with day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., general contractor) must:
 - a. ensure that the SWPPP for portions of the project where they are operators meets the minimum requirements of Part IV (Storm Water Pollution Prevention Plan) and identifies the parties responsible for implementation of control measures identified in the plan;
 - b. ensure that the SWPPP indicates areas of the project where they have operational control over day-to-day activities;
 - c. ensure that the SWPPP for portions of the project where they are operators indicates the name and NPDES permit number of the party(ies) with operational control over project specifications (including the ability to make modifications in specifications);
3. Permittees with operational control over only a portion of a larger construction project (e.g., one of four homebuilders in a subdivision) are responsible for compliance with all applicable terms and conditions of this permit as it relates to their activities on their portion of the construction site, including protection of endangered species and implementation of BMPs and other controls required by the SWPPP. Permittees shall ensure either directly or through coordination with other permittees, that their activities do not render another party's pollution controls ineffective. Permittees must either implement their portions of a common SWPPP or develop and implement their own SWPPP.

Part IV. STORM WATER POLLUTION PREVENTION PLANS

At least one storm water pollution prevention plan (SWPPP) shall be developed for each construction project or site covered by this permit. For more effective coordination of BMPs and opportunities for cost sharing, a cooperative effort by the different operators at a site to prepare and participate in a comprehensive SWPPP is encouraged. Individual operators at a site may, but are not required, to develop separate SWPPPs that cover only their portion of the project provided reference is made to other operators at the site. In instances where there is more than one SWPPP for a site, coordination must be conducted between the permittees to ensure the storm water discharge controls and other measures are consistent with one another (e.g., provisions to protect listed species and critical habitat).

Storm water pollution prevention plans shall be prepared in accordance with good engineering practices. The SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges from the construction site. The SWPPP shall describe and ensure the implementation of practices which will be used to reduce the pollutants in storm water discharges associated with construction activity at the construction site and assure compliance with the terms and conditions of this permit.

When developing SWPPPs, applicants must follow the procedures in Addendum A of this permit to determine whether listed endangered or threatened species or critical habitat would be affected by the applicant's storm water discharges or storm water discharge-related activities. Any information on whether listed species or critical habitat are found in proximity to the construction site must be included in the SWPPP. Any terms or conditions that are imposed under the eligibility requirements of Part I.B.3.e and Addendum A of this permit to protect listed species or critical habitat from storm water discharges or storm water discharge-related activity must be incorporated into the SWPPP. Permittees must implement the applicable provisions of the SWPPP required under this part as a condition of this permit.

A. Deadlines for Plan Preparation and Compliance. The storm water pollution prevention plan shall:

1. be completed prior to the submittal of an NOI to be covered under this permit (except as provided in Parts II.A.5 and II.A.6) updated as appropriate; and
2. provide for compliance with the terms and schedule of the SWPPP beginning with the initiation of construction activities.

B. Signature, Plan Review and Making Plans Available.

1. The SWPPP shall be signed in accordance with Part VI.G, and be retained on-site at the facility which generates the storm water discharge in accordance with Part V (Retention of Records) of this permit.
2. The permittee shall post a notice near the main entrance of the construction site with the following information:
 - a. the NPDES permit number for the project or a copy of the NOI if a permit number has not yet been assigned;
 - b. the name and telephone number of a local contact person;
 - c. a brief description of the project; and

B. Signature, Plan Review and Making Plans Available. (Continued)

- d. the location of the SWPPP if the site is inactive or does not have an on-site location to store the plan.

If posting this information near a main entrance is infeasible due to safety concerns, the notice shall be posted in a local public building. If the construction project is a linear construction project (e.g., pipeline, highway, etc.), the notice must be placed in a publicly accessible location near where construction is actively underway and moved as necessary. This permit does not provide the public with any right to trespass on a construction site for any reason, including inspection of a site; nor does this permit require that permittees allow members of the public access to a construction site.

3. The permittee shall make SWPPPs available upon request to the Director, a State, Tribal or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; or the operator of a municipal separate storm sewer receiving discharges from the site. The copy of the SWPPP that is required to be kept on-site or locally available must be made available to the Director for review at the time of an on-site inspection. Also, in the interest of public involvement, EPA encourages permittees to make their SWPPPs available to the public for viewing during normal business hours.
4. The Director may notify the permittee at any time that the SWPPP does not meet one or more of the minimum requirements of this Part. Such notification shall identify those provision of this permit which are not being met by the SWPPP as well as those requiring modification in order to meet the minimum requirements of this Part. Within seven (7) calendar days of receipt of such notification from the Director (or as otherwise provided by the Director), the permittee shall make the required changes to the SWPPP and shall submit to the Director a written certification that the requested changes have been made. The Director may take appropriate enforcement action for the period of time the permittee was operating under a plan that did not meet the minimum requirements of this permit.

C. Keeping Plans Current. The permittee must amend the storm water pollution prevention plan whenever:

1. There is a change in design, construction, operation, or maintenance which has a significant effect on the discharge of pollutants to the waters of the United States which has not been addressed in the SWPPP; or
2. Inspections or investigations by site operators, local, State, Tribal or Federal officials indicate the SWPPP is proving ineffective in eliminating or significantly minimizing pollutants from sources identified under Part IV.D.1 of this permit, or is otherwise not achieving the general objectives of controlling pollutants in storm water discharges associated with construction activity.

D. Contents of Plan. The storm water pollution prevention plan (SWPPP) shall include the following items:

1. **Site Description.** Each SWPPP shall provide a description of potential pollutant sources and other information as indicated below:
 - a. a description of the nature of the construction activity;

1. Site Description. (Continued)

- b. a description of the intended sequence of major activities which disturb soils for major portions of the site (e.g., grubbing, excavation, grading, utilities and infrastructure installation);
- c. estimates of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading, or other activities including off-site borrow and fill areas;
- d. an estimate of the runoff coefficient of the site for both the pre-construction and post-construction conditions and data describing the soil or the quality of any discharge from the site;
- e. a general location map (e.g., a portion of a city or county map) and a site map indicating the following: drainage patterns and approximate slopes anticipated after major grading activities; areas of soil disturbance; areas which will not be disturbed; locations of major structural and nonstructural controls identified in the SWPPP; locations where stabilization practices are expected to occur; locations of off-site material, waste, borrow or equipment storage areas; surface waters (including wetlands); and locations where storm water discharges to a surface water;
- f. location and description of any discharge associated with industrial activity other than construction, including storm water discharges from dedicated asphalt plants and dedicated concrete plants, which is covered by this permit;
- g. the name of the receiving water(s) and the areal extent and description of wetland or other special aquatic sites (as described under 40 CFR 230.3(q-1)) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project;
- h. a copy of the permit requirements (attaching a copy of this permit is acceptable); and
- i. information on whether listed endangered or threatened species, or critical habitat, are found in proximity to the construction activity and whether such species may be affected by the applicant's storm water discharges or storm water discharge-related activities.

- 2. Controls.** Each SWPPP shall include a description of appropriate control measures (i.e., BMPs) that will be implemented as part of the construction activity to control pollutants in storm water discharges. The SWPPP must clearly describe for each major activity identified in Part IV.D.1.b:
- a) appropriate control measures and the general timing (or sequence) during the construction process that the measures will be implemented; and
 - b) which permittee is responsible for implementation (e.g., perimeter controls for one portion of the site will be installed by Contractor A after the clearing and grubbing necessary for installation of the measure, but before the clearing and grubbing for the remaining portions of the site; and perimeter controls will be actively maintained by Contractor B until final stabilization of those portions of the site up-gradient of the perimeter control; and temporary perimeter controls will be removed by the owner after final stabilization). The description and implementation of control measures shall address the following minimum components:

a. Erosion and Sediment Controls.

(1) *Short and Long Term Goals and Criteria:*

- (a) The construction-phase erosion and sediment controls should be designed to retain sediment on site to the extent practicable.

(1) *Short and Long Term Goals and Criteria:* (Continued)

- (b)** All control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the permittee must replace or modify the control for site situations.
- (c)** If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts (e.g., fugitive sediment in street could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets).
- (d)** Sediment must be removed from sediment traps or sedimentation ponds when design capacity has been reduced by 50%.
- (e)** Litter, construction debris, and construction chemicals exposed to storm water shall be prevented from becoming a pollutant source for storm water discharges (e.g., screening outfalls, picked up daily).
- (f)** Offsite material storage areas (also including overburden and stockpiles of dirt, borrow areas, etc.) used solely by the permitted project are considered a part of the project and shall be addressed in the SWPPP.

(2) *Stabilization Practices:* The SWPPP must include a description of interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Site plans should ensure that existing vegetation is preserved where attainable and that disturbed portions of the site are stabilized. Stabilization practices may include but are not limited to: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Use of impervious surfaces for stabilization should be avoided.

The following records shall be maintained and attached to the SWPPP: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated.

Except as provided in Parts IV.D.2.a.(2)(a), (b), and (c) below, stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

- (a)** Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable.
- (b)** Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of site.

(2) *Stabilization Practices:* (Continued)

- (c) In arid areas (areas with an average annual rainfall of 0 to 10 inches), semi-arid areas (areas with an average annual rainfall of 10 to 20 inches), and areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

(3) *Structural Practices:* The SWPPP must include a description of structural practices to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Structural practices may include but are not limited to: silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. Placement of structural practices in floodplains should be avoided to the degree attainable. The installation of these devices may be subject to section 404 of the CWA.

- (a) For common drainage locations that serve an area with ten (10) or more acres disturbed at one time, a temporary (or permanent) sediment basin that provides storage for a calculated volume of runoff from a 2 year, 24 hour storm from each disturbed acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. When computing the number of acres draining into a common location it is not necessary to include flows from offsite areas and flows from onsite areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin.

In determining whether installing a sediment basin is attainable, the permittee may consider factors such as site soils, slope, available area on site, etc. In any event, the permittee must consider public safety, especially as it relates to children, as a design factor for the sediment basin and alternative sediment controls shall be used where site limitations would preclude a safe design. For drainage locations which serve ten (10) or more disturbed acres at one time and where a temporary sediment basin or equivalent controls is not attainable, smaller sediment basins and/or sediment traps should be used. Where neither the sediment basin nor equivalent controls are attainable due to site limitations, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area and for those side slope boundaries deemed appropriate as dictated by individual site conditions. EPA encourages the use of a combination of sediment and erosion control measures in order to achieve maximum pollutant removal.

- (b) For drainage locations serving less than 10 acres, smaller sediment basins and/or sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area unless a sediment basin providing storage for a calculated volume

(3) *Structural Practices:* (Continued)

of runoff from a 2 year, 24 hour storm or 3,600 cubic feet of storage per acre drained is provided. EPA encourages the use of a combination of sediment and erosion control measures in order to achieve maximum pollutant removal.

- b. Storm Water Management. A description of measures that will be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed must be included in the SWPPP. Structural measures should be placed on upland soils to the degree attainable. The installation of these devices may also require a separate permit under section 404 of the CWA. Permittees are only responsible for the installation and maintenance of storm water management measures prior to final stabilization of the site, and are not responsible for maintenance after storm water discharges associated with construction activity have been eliminated from the site. However, post-construction storm water BMPs that discharge pollutants from point sources once construction is completed, may in themselves, need authorization under a separate NPDES permit.

- (1) Such practices may include but are not limited to: storm water detention structures (including wet ponds); storm water retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems (which combine several practices). The SWPPP shall include an explanation of the technical basis used to select the practices to control pollution where flows exceed predevelopment levels.
- (2) Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel to provide a non-erosive flow velocity from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g. no significant changes in the hydrological regime of the receiving water).

c. Other Controls.

- (1) No solid materials, including building materials, shall be discharged to waters of the United States, except as authorized by a permit issued under section 404 of the CWA.
- (2) Off-site vehicle tracking of sediments and the generation of dust shall be minimized.
- (3) The SWPPP shall be consistent with applicable State, Tribal and/or local waste disposal, sanitary sewer or septic system regulations to the extent these are located within the permitted area.
- (4) The SWPPP shall include a description of construction and waste materials expected to be stored on-site with updates as appropriate. The SWPPP shall also include a description of controls to reduce pollutants from these materials including storage practices to minimize exposure of the materials to storm water, and spill prevention and response.
- (5) The SWPPP shall include a description of pollutant sources from areas other than construction (including storm water discharges from dedicated asphalt plants and dedicated concrete plants), and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges.

c. Other Controls. (Continued)

- (6) The SWPPP shall include a description of measures necessary to protect listed endangered or threatened species, or critical habitat, including any terms or conditions that are imposed under the eligibility requirements of Part I.B.3.e (4) of this permit. Failure to describe and implement such measures will result in storm water discharges from construction activities that are ineligible for coverage under this permit.

d. Approved State, Tribal or Local Plans.

- (1) Permittees which discharge storm water associated with construction activities must ensure their storm water pollution prevention plan is consistent with requirements specified in applicable sediment and erosion site plans or site permits, or storm water management site plans or site permits approved by State, Tribal, or local officials.
- (2) Storm water pollution prevention plans must be updated as necessary to remain consistent with any changes applicable to protecting surface water resources in sediment and erosion site plans or site permits, or storm water management site plans or site permits approved by State, Tribal or local officials for which the permittee receives written notice..
3. **Maintenance.** All erosion and sediment control measures and other protective measures identified in the SWPPP must be maintained in effective operating condition. If site inspections required by Part IV.D.4. identify BMPs that are not operating effectively, maintenance shall be performed before the next anticipated storm event, or as necessary to maintain the continued effectiveness of storm water controls. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable.
4. **Inspections.** Qualified personnel (provided by the permittee or cooperatively by multiple permittees) shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, and locations where vehicles enter or exit the site, at least once every fourteen (14) calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

Where sites have been finally or temporarily stabilized, runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or frozen ground exists), or during seasonal arid periods in arid areas (areas with an average annual rainfall of 0 to 10 inches) and semi-arid areas (areas with an average annual rainfall of 10 to 20 inches) such inspections shall be conducted at least once every month.

Permittees are eligible for a waiver of monthly inspection requirements until one month **before** thawing conditions are expected to result in a discharge if all of the following requirements are met: 1) the project is located in an area where frozen conditions are anticipated to continue for extended periods of time (i.e., more than one month); 2) land disturbance activities have been suspended; and 3) the beginning and ending dates of the waiver period are documented in the SWPPP.

- a. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Sediment and erosion control measures identified in the SWPPP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to

4. Inspections. (Continued)

receiving waters. Where discharge locations are inaccessible, nearby downstream locations shall be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.

- b. Based on the results of the inspection, the SWPPP shall be modified as necessary (e.g., show additional controls on map required by Part IV.D.1; revise description of controls required by Part IV.D.2) to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP shall be completed within 7 calendar days following the inspection. If existing BMPs need to be modified or if additional BMPs are necessary, implementation shall be completed before the next anticipated storm event. If implementation before the next anticipated storm event is impracticable, they shall be implemented as soon as practicable.
- c. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, and major observations relating to the implementation of the SWPPP shall be made and retained as part of the SWPPP for at least three years from the date that the site is finally stabilized. Major observations should include: the location(s) of discharges of sediment or other pollutants from the site; location(s) of BMPs that need to be maintained; location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location; and location(s) where additional BMPs are needed that did not exist at the time of inspection. Actions taken in accordance with Part IV.D.4.b of this permit shall be made and retained as part of the storm water pollution prevention plan for at least three years from the date that the site is finally stabilized. Such reports shall identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with Part VI.G of this permit.

- 5. Non-Storm Water Discharges.** Except for flows from fire fighting activities, sources of non-storm water listed in Part III.A.2 or 3 of this permit that are combined with storm water discharges associated with construction activity must be identified in the SWPPP. The SWPPP shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

Part V. RETENTION OF RECORDS

- A. **Documents.** The permittee shall retain copies of storm water pollution prevention plans and all reports required by this permit, and records of all data used to complete the Notice of Intent to be covered by this permit, for a period of at least three years from the date that the site is finally stabilized. This period may be extended by request of the Director at any time.
- B. **Accessibility.** The permittee shall retain a copy of the storm water pollution prevention plan required by this permit (including a copy of the permit language) at the construction site (or other local location accessible to the Director, a State, Tribal or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; or the operator of a municipal separate storm sewer receiving discharges from the site) from the date of project initiation to the date of final stabilization. Permittees with day-to-day operational control over SWPPP implementation shall have a copy of the SWPPP available at a central location on-site for the use of all operators and those identified as having responsibilities under the SWPPP whenever they are on the construction site.
- C. **Addresses.** Except for the submittal of NOIs and NOTs (see Parts II.C and VIII.B, respectively), all written correspondence concerning discharges in any State, Indian Country land or from any Federal facility covered under this permit and directed to the EPA, including the submittal of individual permit applications, shall be sent to the following address:

United States EPA, Region 8
Ecosystems Protection Program (8EPR-EP)
Storm Water Staff
999 18th Street, Suite 500
Denver, CO 80202-2466

Part VI. STANDARD PERMIT CONDITIONS**A. Duty to Comply.**

1. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of CWA and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.
2. **Penalties for Violations of Permit Conditions.** The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (Federal Register: December 31, 1996, Volume 61, Number 252, pages 69359-69366, as corrected, March 20, 1997, Volume 62, Number 54, pages 13514-13517) as mandated by the Debt Collection Improvement Act of 1996 for inflation on a periodic basis. This rule allows EPA's penalties to keep pace with inflation. The Agency is required to review its penalties at least once every four years thereafter and to adjust them as necessary for inflation according to a specified formula. The civil and administrative penalties listed below were adjusted for inflation starting in 1996.

a. Criminal.

- (1) *Negligent Violations.* The CWA provides that any person who negligently violates permit conditions implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than 1 year, or both.
- (2) *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than \$5,000 nor more than \$50,000 per day of violation, or by imprisonment for not more than 3 years, or both.
- (3) *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he is placing another person in imminent danger of death or serious bodily injury is subject to a fine of not more than \$250,000, or by imprisonment for not more than 15 years, or both.
- (4) *False Statement.* The CWA provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act, shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than two years, or by both. If a conviction is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than four years, or by both. (See section 309.c.4 of the Clean Water Act).

- b. **Civil Penalties.** The CWA provides that any person who violates a permit condition implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed \$27,500 per day for each violation.

2. Penalties for Violations of Permit Conditions. (Continued)

- c. **Administrative Penalties.** The CWA provides that any person who violates a permit condition implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows:
- (1) *Class I Penalty.* Not to exceed \$11,000 per violation nor shall the maximum amount exceed \$27,500.
 - (2) *Class II Penalty.* Not to exceed \$11,000 per day for each day during which the violation continues nor shall the maximum amount exceed \$137,500.
- B. **Continuation of the Expired General Permit.** If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with the Administrative Procedures Act and remain in force and effect. Any permittee who was granted permit coverage prior to the expiration date will automatically remain covered by the continued permit until the earlier of:
1. Reissuance or replacement of this permit, at which time the permittee must comply with the Notice of Intent conditions of the new permit to maintain authorization to discharge; or
 2. the permittee's submittal of a Notice of Termination; or
 3. issuance of an individual permit for the permittee's discharges; or
 4. a formal permit decision by the Director not to reissue this general permit, at which time the permittee must seek coverage under an alternative general permit or an individual permit.
- C. **Need to Halt or Reduce Activity not a Defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- D. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
- E. **Duty to Provide Information.** The permittee shall furnish to the Director or an authorized representative of the Director any information which is requested to determine compliance with this permit or other information.
- F. **Other Information.** When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the Director, he or she shall promptly submit such facts or information.
- G. **Signatory Requirements.** All Notices of Intent, Notices of Termination, storm water pollution prevention plans, reports, certifications or information either submitted to the Director or the operator of a large or medium municipal separate storm sewer system, or that this permit requires be maintained by the permittee, shall be signed as follows:
1. All Notices of Intent and Notices of Termination shall be signed as follows:

G. Signatory Requirements. (Continued)

- a. for a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25,000,000 (in second-quarter 1980 dollars) if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
 - b. for a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
 - c. for a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (1) the chief executive officer of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).
2. All reports required by this permit and other information requested by the Director or authorized representative of the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
- a. the authorization is made in writing by a person described above and submitted to the Director.
 - b. the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).
 - c. Changes to Authorization. If an authorization under Part II.B is no longer accurate because a different operator has responsibility for the overall operation of the construction site, a new Notice of Intent satisfying the requirements of Part II.B must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative. The change in authorization must be submitted within the time frame specified in Part II.A.3, and sent to the address specified in Part II.C.
 - d. Certification. Any person signing documents under Part VI.G shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

- H. **Penalties for Falsification of Reports.** Section 309(c)(4) of the Clean Water Act provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than two years, or by both.
- I. **Oil and Hazardous Substance Liability.** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under section 311 of the CWA or section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).
- J. **Property Rights.** The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.
- K. **Severability.** The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.
- L. **Requiring an Individual Permit or an Alternative General Permit.**
1. The Director may require any person authorized by this permit to apply for and/or obtain either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition the Director to take action under this paragraph. Where the Director requires a permittee authorized to discharge under this permit to apply for an individual NPDES permit, the Director shall notify the permittee in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the permittee to file the application, and a statement that on the effective date of issuance or denial of the individual NPDES permit or the alternative general permit as it applies to the individual permittee, coverage under this general permit shall automatically terminate. Applications shall be submitted to the appropriate Regional Office indicated in Part V.C of this permit. The Director may grant additional time to submit the application upon request of the applicant. If a permittee fails to submit in a timely manner an individual NPDES permit application as required by the Director under this paragraph, then the applicability of this permit to the individual NPDES permittee is automatically terminated at the end of the day specified by the Director for application submittal.
 2. Any permittee authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. In such cases, the permittee shall submit an individual application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii), with reasons supporting the request, to the Director at the address for the appropriate Regional Office indicated in Part V.C of this permit. The request may be granted by issuance of any individual permit or an alternative general permit if the reasons cited by the permittee are adequate to support the request.
 3. When an individual NPDES permit is issued to a permittee otherwise subject to this permit, or the permittee is authorized to discharge under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual NPDES permit is denied to an owner or operator otherwise subject to this permit, or the owner or operator is denied for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the date of such denial, unless otherwise specified by the Director.

M. State/Tribal Environmental Laws.

1. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State/Tribal law or regulation under authority preserved by section 510 of the Act.
2. No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

N. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of this permit.

O. Inspection and Entry. The permittee shall allow the Director or an authorized representative of EPA, the State/Tribe, or, in the case of a construction site which discharges through a municipal separate storm sewer, an authorized representative of the municipal owner/operator or the separate storm sewer receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;
2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and
3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

P. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Part VII. REOPENER CLAUSE

- A. If there is evidence indicating that the storm water discharges authorized by this permit cause, have the reasonable potential to cause or contribute to, a violation of a water quality standard, the permittee may be required to obtain an individual permit or an alternative general permit in accordance with Part I.C of this permit, or the permit may be modified to include different limitations and/or requirements.
- B. Permit modification or revocation will be conducted according to 40 CFR 122.62, 122.63, 122.64 and 124.5.
- C. EPA may propose a modification to this permit after further discussions between the Agency and the Advisory Council on Historic Preservation for the protection of historic properties.

Part VIII. TERMINATION OF COVERAGE

A. Notice of Termination. Permittees must submit a completed Notice of Termination (NOT) that is signed in accordance with Part VI.G of this permit when one or more of the conditions contained in Part I.D.2. (Terminating Coverage) have been met at a construction project. The NOT form found in Addendum D will be used unless it has been replaced by a revised version by the Director. The Notice of Termination shall include the following information:

1. The NPDES permit number for the storm water discharge identified by the Notice of Termination;
2. An indication of whether the storm water discharges associated with construction activity have been eliminated (i.e., regulated discharges of storm water are being terminated) or the permittee is no longer an operator at the site;
3. The name, address and telephone number of the permittee submitting the Notice of Termination;
4. The name of the project and street address (or a description of location if no street address is available) of the construction site for which the notification is submitted;
5. The latitude and longitude of the construction site; and
6. The following certification, signed in accordance with Part VI.G (signatory requirements) of this permit. For construction projects with more than one permittee and/or operator, the permittee need only make this certification for those portions of the construction site where the permittee was authorized under this permit and not for areas where the permittee was not an operator:

"I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that authorized by a general permit have been eliminated or that I am no longer the operator of the facility or construction site. I understand that by submitting this notice of termination, I am no longer authorized to discharge storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violations of this permit or the Clean Water Act."

For the purposes of this certification, elimination of storm water discharges associated with construction activity means that all disturbed soils at the portion of the construction site where the operator had control have been finally stabilized (as defined in Part IX.I) and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time to ensure final stabilization is maintained, or that all storm water discharges associated with construction activities from the identified site that are authorized by a NPDES general permit have otherwise been eliminated from the portion of the construction site where the operator had control.

B. Addresses.

1. All Notices of Termination, signed in accordance with Part VI.G of this permit, are to be submitted using the form provided by the Director (or a photocopy thereof), to the address specified on the NOT form.

Part IX. DEFINITIONS

- A. **"Best Management Practices" ("BMPs")** means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.
- B. **"Control Measure"** as used in this permit, refers to any Best Management Practice or other method used to prevent or reduce the discharge of pollutants to waters of the United States.
- C. **"Commencement of Construction"** the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.
- D. **"CWA"** means the Clean Water Act or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq.
- E. **"Director"** means the Regional Administrator of the Environmental Protection Agency or an authorized representative.
- F. **"Discharge"** when used without qualification means the "discharge of a pollutant."
- G. **"Discharge of Storm Water Associated with Construction Activity"** as used in this permit, refers to a discharge of pollutants in storm water runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavation), construction materials or equipment storage or maintenance (e.g., fill piles, borrow areas, concrete truck washout, fueling), or other industrial storm water directly related to the construction process (e.g., concrete or asphalt batch plants) are located.
- H. **"Facility or Activity"** means any NPDES "point source" or any other facility or activity (including land and appurtenances thereto) that is subject to regulation under the NPDES program.
- I. **"Final Stabilization"** means that either:
1. All soil disturbing activities at the site have been completed and a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed. In some parts of the country, background native vegetation will cover less than 100% of the ground (e.g., arid areas, beaches). Establishing at least 70% of the natural cover of native vegetation meets the vegetative cover criteria for final stabilization (e.g., if the native vegetation covers 50% of the ground, 70% of 50% would require 35% total cover for final stabilization; on a beach with no natural vegetation, no stabilization is required); or
 2. For individual lots in residential construction by either: a) the homebuilder completing final stabilization as specified above, or b) the homebuilder establishing temporary stabilization including perimeter controls for an individual lot prior to occupation of the home by the homeowner and informing the homeowner of the need for, and benefits of, final stabilization. (Homeowners typically have an incentive to put in landscaping functionally equivalent to final stabilization as quick as possible to keep mud out of their homes and off their sidewalks and driveways.); or

I. "Final Stabilization" (continued)

3. For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to "waters of the United States," and areas which are not being returned to their preconstruction agricultural use must meet the final stabilization criteria in (1) or (2) above.

J. "Flow-Weighted Composite Sample" means a composite sample consisting of a mixture of aliquots collected at a constant time interval, where the volume of each aliquot is proportional to the flow rate of the discharge.

K. "Large and Medium Municipal Separate Storm Sewer System" - means all municipal separate storm sewers that are either:

1. Located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and G of 40 CFR 122); or
2. Located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties (these counties are listed in Appendices H and I of 40 CFR 122); or
3. Owned or operated by a municipality other than those described in paragraph (i) or (ii) and that are designated by the Director as part of the large or medium municipal separate storm sewer system.

L. "NOI" means Notice of Intent to be covered by this permit (see Part II of this permit.)

M. "NOT" means Notice of Termination (see Part VIII of this permit).

N. "Operator" for the purpose of this permit and in the context of storm water associated with construction activity, means any party associated with a construction project that meets either of the following two criteria:

1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
2. The party has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a storm water pollution prevention plan for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

This definition is provided to inform permittees of EPA's interpretation of how the regulatory definitions of "owner or operator" and "facility or activity" are applied to discharges of storm water associated with construction activity.

O. "Owner or Operator" means the owner or operator of any "facility or activity" subject to regulation under the NPDES program.

- P. **"Point Source"** means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.
- Q. **"Pollutant"** is defined at 40 CFR 122.2. A partial listing from this definition includes: dredged spoil, solid waste, sewage, garbage, sewage sludge, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste.
- R. **"Runoff Coefficient"** means the fraction of total rainfall that will appear at the conveyance as runoff.
- S. **"Storm Water"** means storm water runoff, snow melt runoff, and surface runoff and drainage.
- T. **"Storm Water Associated with Industrial Activity"** is defined at 40 CFR 122.26(b)(14) and incorporated here by reference. Most relevant to this permit is 40 CFR 122.26(b)(14)(x), which relates to construction activity including clearing, grading and excavation activities that result in the disturbance of five (5) or more acres of total land area, or are part of a larger common plan of development or sale.
- U. **"Waters of the United States"** means:
1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
 2. All interstate waters, including interstate "wetlands";
 3. All other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
 - a. Which are or could be used by interstate or foreign travelers for recreational or other purposes;
 - b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - c. Which are used or could be used for industrial purposes by industries in interstate commerce;
 4. All impoundments of waters otherwise defined as waters of the United States under this definition;
 5. Tributaries of waters identified in paragraphs (a) through (d) of this definition;
 6. The territorial sea; and
 7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs 1. through 6. of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds for steam electric generation stations per 40 CFR 423) which also meet the criteria of this definition) are not waters of the United States. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

ADDENDUM A - ENDANGERED SPECIES

I. Instructions for Applicants

A. Background

To meet its obligations under the Clean Water Act and the Endangered Species Act (ESA) and to promote those Acts' goals, the Environmental Protection Agency (EPA) is seeking to ensure the activities regulated by the Construction General Permit (CGP) are protective of endangered and threatened species and critical habitat. To ensure that those goals are met, applicants for CGP coverage are required under Part I.B.3.e. to assess the impacts of their storm water discharges and storm water discharge-related activities on Federally listed endangered and threatened species ("listed species") and designated critical habitat ("critical habitat") by following Steps One through Six listed below. EPA strongly recommends that applicants follow these steps at the earliest possible stage to ensure that measures to protect listed species and critical habitat are incorporated early in the planning process. At minimum, the procedures should be followed when developing the storm water pollution prevention plan.

Permittees and applicants also have an independent ESA obligation to ensure that their activities do not result in any prohibited "takes" of listed species.¹ Many of the measures required in the CGP and in these instructions to protect species may also assist permittees in ensuring that their construction activities do not result in a prohibited take of species in violation of § 9 of the ESA. Applicants who plan construction activities in areas that harbor endangered and threatened species are advised to ensure that they are protected from potential takings liability under ESA § 9 by obtaining either an ESA § 10 permit or by requesting formal consultation under ESA § 7 (as described in more detail in Step Seven below). Applicants who seek protection from takings liability should be aware that it is possible that some specific construction activities may be too unrelated to storm water discharges to be afforded incidental take coverage through an ESA § 7 consultation that is performed to meet the eligibility requirements for CGP coverage. In such instances, applicants should apply for an ESA § 10 permit. Where applicants are not sure whether to pursue a § 10 permit or a § 7 consultation for takings protection, they should confer with the appropriate Fish and Wildlife Service (FWS) or National Marine Fisheries Service (NMFS) office.

This permit provides for the possibility of multiple permittees at a construction site. Applicants should be aware that in many cases they can meet the permit eligibility requirements by relying on another operator's certification of eligibility under Part I.B.3.e.(2)(a), (b), or (c). This is allowed under Part I.B.3.e.(2)(d) of the permit. However, the other operator's certification must apply to the applicant's project area and must address the effects from the applicant's storm water discharges and storm water discharge-related activities on listed species and critical habitat. By certifying eligibility under Part I.B.3.e.(2)(d), the applicant agrees to comply with any measures or controls upon which the other operator's certification under Part I.B.3.e.(2)(a), (b) or (c) was based. This situation will typically occur where a developer or primary contractor, such as one for construction of a subdivision or industrial park, conducts a comprehensive assessment of effects on listed species and critical habitat for the entire construction project, certifies eligibility under Part I.B.3.e.(2)(a), (b) or (c), and that certification is relied upon by other operators (i.e., contractors) at the site. However, applicants

¹ Section 9 of the ESA prohibits any person from "taking" a listed species (e.g., harassing or harming it) unless: 1) the taking is authorized through a "incidental take statement" as part of undergoing ESA § 7 formal consultation; 2) where an incidental take permit is obtained under ESA § 10 (which requires the development of a habitat conservation plan); or 3) where otherwise authorized or exempted under the ESA. This prohibition applies to all entities including private individuals, businesses, and governments.

A. Background (Continued)

that consider relying on another operator's certification should carefully review that certification along with any supporting information. If an applicant does not believe that the operator's certification provides adequate coverage for the applicant's storm water discharges and storm water discharge-related activities or for the applicant's particular project area, the applicant should provide its own independent certification under Part I.B.3.e.(2)(a), (b), or (c).

B. Procedures

To receive coverage under the Construction General Permit, applicants must assess the potential effects of their storm water discharges and storm water discharge-related activities on listed species and their critical habitat. To make this assessment, applicants must follow the steps outlined below prior to completing and submitting Notice of Intent (NOI) form. Applicants who are able to certify eligibility under Parts I.B.3.e.(2)(b), (c) or (d) because of a previously issued ESA § 10 permit, a previously completed ESA § 7 consultation, or because the applicant's activities were already addressed in another operator's certification of eligibility may proceed directly to Step Six.

Note - EPA's new NOI form which is included in Addendum C of this permit (published in the Federal Register on March 6, 1998, 63 FR 11253), requires that applicants provide detailed certification information on listed species. Previous versions of NOI forms should not be used any longer because they do not contain the specific certification provisions relating to listed species and critical habitats at construction projects. Use of the older NOI forms do not relieve applicants of their obligation to follow the procedures listed below to determine if their construction storm water discharges or storm water discharge-related activities meet permit eligibility requirements for the protection of listed species and critical habitat. By following these instructions, applicants will have sufficient information on listed species and critical habitat in order to complete the new NOI form (see Addendum C, page 45) and sign the certification statement.

Step One: Determine if the Construction Site Is Found Within Designated Critical Habitat for Listed Species

Some, but not all, listed species have designated critical habitat. Exact locations of such habitat is provided in the Service regulations at 50 CFR Parts 17 and 226. To determine if their construction site occurs within designated critical habitat, applicants should either:

- Contact the nearest Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) Office. A list of FWS and NMFS offices is found in Section II of this Addendum; or
- Contact the State or Tribal Natural Heritage Centers. These centers compile and disseminate information on Federally listed and other protected species. They frequently have the most current information on listed species and critical habitat. A list of these centers is provided in Section III of this Addendum; or

Step One: (Continued)

- Review those regulations (which can be found in many larger libraries).

If the construction site is not located in designated critical habitat, then the applicant does not need to consider impacts to critical habitat when following Steps Two through Six below. If the site is located within critical habitat, then the applicant must look at impacts to critical habitat when following Steps Two through Six. Note that many but not all measures imposed to protect listed species under these steps will also protect critical habitat. Thus, meeting the eligibility requirements of this permit may require measures to protect critical habitat that are separate from those to protect listed species.

Step Two: Determine if Listed Species are Located in the County(ies) Where the Construction Activity Will Occur.

Section IV of the Addendum contains a county-by-county list of listed endangered and threatened species ("listed species"), and proposed endangered and threatened species ("proposed species"). Since the list was current as of September 1, 1997, applicants must also check with other sources for updated species and county information. These sources include: Sections II and III of this Addendum; EPA's Office of Wastewater Management's web page at "<http://www.epa.gov/owm>" where updates of the county-by-county list will be posted on a periodic basis; Federal Register Notices; State wildlife protection offices; a biologist or similar professional in the environmental field; or any other method which can be reasonably expected to provide this information. Applicants with construction projects located in EPA Region 2 and Region 6 can call the Storm Water General Permits Hotline at (800) 245-6510 for further assistance, while applicants with projects located in EPA Regions 1, 3, 7, 8, 9 and 10 may contact the appropriate EPA Regional Office.

Where a facility is located in more than one county, the lists for all counties should be reviewed. Where a facility discharges into a water body which serves as a border between counties or which crosses a county line which is in the immediate vicinity of the point of discharge, applicants should also review the species list for the county which lies immediately downstream or is across the water body from the point of discharge.

After a review of the available information from the sources mentioned above, if no listed species are located in a facility's county, and the construction site is not located in critical habitat as described under Step One, an applicant is eligible for CGP coverage without further inquiry into the presence of, or effect to, listed species. The applicant must check the appropriate certification item on the NOI form (Part I.B.3.e.(2)(a)).

Once the applicant has determined which listed species are located in his or her facility's county, the applicant must follow Step Three.

Step Three: Determine if any Federally Listed Endangered and Threatened Species May Be Present in the Project Area

The project area consists of:

Step Three: (Continued)

- The areas on the construction site where storm water discharges originate and flow toward the point of discharge into the receiving waters (including areas where excavation, site development, or other ground disturbance activities occur) and the immediate vicinity.

Example(s)

1. Where bald eagles nest in a tree that is on or bordering a construction site and could be disturbed by the construction activity.
 2. Where grading causes storm water to flow into a small wetland or other habitat that is on the site which contains listed species.
- The areas where storm water discharges flow from the construction site to the point of discharge into receiving waters.

Example(s)

1. Where storm water flows into a ditch, swale, or gully which leads to receiving waters and where listed species (such as amphibians) are found in the ditch, swale, or gully.
- The areas where storm water from construction activities discharge into receiving waters and the areas in the immediate vicinity of the point of discharge.

Example(s)

1. Where storm water from construction activities discharges into a stream segment that is known to harbor listed aquatic species.
- The areas where storm water BMPs will be constructed and operated, including any areas where storm water flows to and from BMPs.

Example(s)

1. Where a storm water retention pond would be built.

The project area will vary with the size and structure of the construction activity, the nature and quantity of the storm water discharges, the storm water discharge-related activities and the type of receiving water. Given the number of construction activities potentially covered by the CGP, no specific method to determine whether listed species may be located in the project area is required for coverage under the CGP. Instead, applicants should use the method which allows them to determine, to the best of their knowledge, whether listed species are located in their project area. These methods may include:

- Conducting visual inspections: This method may be particularly suitable for construction sites that are smaller in size or located in non-natural settings such as highly urbanized areas or industrial parks where there is little or no natural habitat, or for construction activities that discharge directly into municipal storm water collection systems.

Step Three: (Continued)

- Contacting the nearest State or Tribal wildlife agency, the Fish and Wildlife Service (FWS), or the National Marine Fisheries Service (NMFS). Many endangered and threatened species are found in well-defined areas or habitats. Such information is frequently known to State, Tribal, or Federal wildlife agencies. A list of FWS and NMFS offices is provided in Section II of this Addendum below.
- Contacting local/regional conservation groups or the State or Tribal Natural Heritage Centers (see Section III of this Addendum). State and local conservation groups may have location specific listed species information. The Natural Heritage Centers inventory species and their locations and maintain lists of sightings and habitats.
- Submitting a data request to a Natural Heritage Center. Many of these centers will provide site specific information on the presence of listed species in a project area. Some of these centers will charge a fee for researching data requests.
- Conducting a formal biological survey. Larger construction sites with extensive storm water discharges may choose to conduct biological surveys as the most effective way to assess whether species are located in the project area and whether there are likely adverse effects. Biological surveys are frequently performed by environmental consulting firms. A biological survey can be used to follow Steps Four through Six of these instructions.
- Conducting an environmental assessment under the National Environmental Policy Act (NEPA). Some construction activities may require environmental assessments under NEPA. Such assessments may indicate if listed species are in the project area. Coverage under the CGP does not trigger such an assessment because the permit does not regulate any dischargers subject to New Source Performance Standards under Section 306 of the Clean Water Act, and is thus statutorily exempted from NEPA. See CWA § 511(c). However, some construction activities might require review under NEPA because of Federal funding or other Federal involvement in the project.

If no species are found in the project area, an applicant is eligible for CGP coverage. Applicants must provide the necessary certification on the NOI form. If listed species are found in the project area, applicants must indicate the location and nature of this presence in the storm water pollution prevention plan and follow Step Four.

Step Four: Determine if Listed Species or Critical Habitat are likely to be Adversely Affected by the Construction Activity's Storm Water Discharges or Storm Water Discharge-related Activities.

To receive CGP coverage, applicants must assess whether their storm water discharges or storm water discharge-related activities are likely to adversely affect listed species or critical habitat.

“Storm water discharge-related activities” include:

- activities which cause, contribute to, or result in point source storm water pollutant discharges, including but not limited to excavation, site development, grading, and other surface disturbance activities; and

Step Four: (Continued)

- measures to control storm water discharges including the siting, construction, operation of best management practices (BMPs) to control, reduce or prevent storm water pollution.

Potential adverse effects from storm water discharges and storm water discharge-related activities include:

- Hydrological. Storm water discharges may cause siltation, sedimentation or induce other changes in receiving waters such as temperature, salinity or pH. These effects will vary with the amount of storm water discharged and the volume and condition of the receiving water. Where a storm water discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely. Construction activity itself may also alter drainage patterns on a site where construction occurs which can impact listed species or critical habitat.
- Habitat. Excavation, site development, grading, and other surface disturbance activities from construction activities, including the installation or placement of storm water BMPs, may adversely affect listed species or their habitat. Storm water may drain or inundate listed species habitat.
- Toxicity. In some cases, pollutants in storm water may have toxic effects on listed species.

The scope of effects to consider will vary with each site. If the applicant is having difficulty in determining whether his or her project is likely to adversely effect a listed specie or critical habitat, then the appropriate office of the FWS, NMFS or Natural Heritage Center listed in Sections II and III of this Addendum should be contacted for assistance. If adverse effects are not likely, then the applicant should make the appropriate certification on the NOI form and apply for coverage under the permit. If adverse effects are likely, applicants must follow Step Five.

Step Five: Determine if Measures Can Be Implemented To Avoid any Adverse Effects

If an applicant makes a preliminary determination that adverse effects are likely, it can still receive coverage under Part I.B.3.e.(2)(a) of the CGP if appropriate measures are undertaken to avoid or eliminate the likelihood of adverse effects prior to applying for permit coverage. These measures may involve relatively simple changes to construction activities such as re-routing a storm water discharge to bypass an area where species are located, relocating BMPs, or by changing the “footprint” of the construction activity. Applicants may wish to contact the FWS and/or NMFS to see what appropriate measures might be suitable to avoid or eliminate the likelihood of adverse impacts to listed species and/or critical habitat. (See 50 CFR 402.13(b)). This can entail the initiation of informal consultation with the FWS and/or NMFS which is described in more detail in Step Six.

Step Five: (Continued)

If applicants adopt measures to avoid or eliminate adverse affects, they must continue to abide by those measures during the course of permit coverage. These measures must be described in the storm water pollution prevention plan and may be enforceable as permit conditions. If appropriate measures to avoid the likelihood of adverse effects are not available to the applicant, the applicant must follow Step Six.

Step Six: Determine if the Eligibility Requirements of Part I.B.3.e.(2)(b)-(d) Can Be Met.

Where adverse effects are likely, the applicant must contact the EPA and FWS/NMFS. Applicants may still be eligible for CGP coverage if any likely adverse effects can be addressed through meeting the criteria of Part I.B.3.e.(2)(b)-(d) of the permit. These criteria are as follows:

1. An ESA Section 7 Consultation is Performed for the Applicant's Activity (See Part I.B.3.e.(2)(b))

Formal or informal ESA § 7 consultation is performed with the FWS and/or NMFS which addresses the effects of the applicant's storm water discharges and storm water discharge-related activities on listed species and critical habitat. The formal consultation must result in either a "no jeopardy opinion" or a "jeopardy opinion" that identifies reasonable and prudent alternatives to avoid jeopardy which are to be implemented by the applicant. The informal consultation must result in a written concurrence by the Service(s) on a finding that the applicant's storm water discharge(s) and storm water discharge-related activities are not likely to adversely affect listed species or critical habitat (for informal consultation, see 50 CFR 402.13).

Most consultations are accomplished through informal consultation. By the terms of this permit, EPA has automatically designated applicants as non-Federal representatives for the purpose of conducting informal consultations. See Part I.B.3.e.(5) and 50 CFR 402.08 and 402.13. When conducting informal ESA § 7 consultation as a non-Federal representative, applicants must follow the procedures found in 50 CFR 402 of the ESA regulations.

Applicants must also notify EPA and the Services of their intention and agreement to conduct consultation as a non-Federal representative. Consultation may occur in the context of another Federal action at the construction site (e.g., where ESA § 7 consultation was performed for issuance of a wetlands dredge and fill permit for the project or where a NEPA review is performed for the project which incorporates a section 7 consultation). Any terms and conditions developed through consultations to protect listed species and critical habitat must be incorporated into the SWPPP. As noted above, applicants may, if they wish, initiate consultation with the Services at Step Five.

Whether ESA § 7 consultation must be performed with either the FWS, NMFS or both Services depends on the listed species which may be affected by the applicant's activity. In general, NMFS has jurisdiction over marine, estuarine, and anadromous species. Applicants should also be aware that while formal § 7 consultation provides protection from incidental takings liability, informal consultation does not.

Step Six: (Continued)

2. An Incidental Taking Permit Under Section 10 of the ESA is Issued for the Applicants Activity (See Part I.B.3.e.(2)(c))

The applicant's construction activities are authorized through the issuance of a permit under § 10 of the ESA and that authorization addresses the effects of the applicant's storm water discharge(s) and storm water discharge-related activities on listed species and critical habitat. Applicants must follow FWS and/or NMFS procedures when applying for an ESA Section 10 permit (see 50 CFR § 17.22(b)(1) (FWS) and § 222.22 (NMFS)). Application instructions for Section 10 permits for NMFS species can be obtained by 1) accessing the "Office of Protected Resources" sector of the NMFS Home Page at "<http://www.nmfs.gov>" or by contacting the National Marine Fisheries Service, Office of Protected Resources, Endangered Species Division, F/PR3, 1315 East-West Highway, Silver Spring, Maryland 20910; telephone (301) 713-1401, fax (301) 713-0376.

3. The Applicant Is Covered Under the Eligibility Certification of Another Operator for the Project Area (See Part I.B.3.e.(2)(d))

The applicant's storm water discharges and storm water discharge-related activities were already addressed in another operator's certification of eligibility under Part I.B.3.e.(2)(b), or (c) which also included the applicant's project area. By certifying eligibility under Part I.B.3.e.(2)(d), the applicant agrees to comply with any measures or controls upon which the other operator's certification under Part I.B.3.e.(2)(a), (b) or (c) was based. Certification under Part I.B.3.e.(2)(d) is discussed in more detail in Section I.A. of this addendum.

The applicant must comply with any terms and conditions imposed under the eligibility requirements of paragraphs I.B.3.e.(2)(a), (b), (c), (d) to ensure that its storm water discharges and storm water discharge-related activities are protective of listed species and/or critical habitat. Such terms and conditions must be incorporated in the project's SWPPP. If the eligibility requirements of Part I.B.3.e.(2)(a)-(d) cannot be met, then the applicant may not receive coverage under the CGP. Applicants should then consider applying to EPA for an individual permit.

II. LIST OF FISH AND WILDLIFE SERVICE OFFICES

A. U.S. FISH AND WILDLIFE SERVICE OFFICES

National Website For Endangered Species Information

Endangered Species Home page:
<http://www.fws.gov/~r9endspp/endspp.html>

Regional, State, Field and Project Offices Applicable to This Permit.

Region Six - Regional Office	
Division Chief, Endangered Species U.S. Fish and Wildlife Service ARD-Ecological Services P.O. Box 25486, DFC Denver, CO 80225	
State, Field, and Project Offices (Region Six)	
Field Supervisor U.S. Fish and Wildlife Service Colorado Field Office 730 Simms, Suite 290 Golden, CO 80401-4798	Field Supervisor U.S. Fish and Wildlife Service Western Colorado Field Office 764 Horizon Drive South, Annex A Grand Junction, CO 81506-3946
E.S. Coordinator U.S. Fish and Wildlife Service Rocky Mountain Arsenal National Wildlife Area, Building 111 Commerce City, CO 80022-1748	Colorado River Recovery Coordinator U.S. Fish and Wildlife Service P.O. Box 25486, DFC Denver, CO 80225

III. NATURAL HERITAGE CENTER

The Natural Heritage Network comprises 85 biodiversity data centers throughout the Western Hemisphere. These centers collect, organize, and share data relating to endangered and threatened species and habitat. The network was developed to inform land-use decisions for developers, corporations, conservationists, and government agencies and is also consulted for research and educational purposes. The centers maintain a **Natural Heritage Network Control Server Website** (<http://www.heritage.tnc.org>) which provides website and other access to a large number of specific biodiversity centers. The center located in Colorado is listed below:

Colorado Natural Heritage Program
Colorado State University
254 General Services Building
Fort Collins, CO 80523
970/491-1309 Fax: 970/491-3349

IV. COUNTY LIST OF ENDANGERED AND THREATENED SPECIES IN COLORADO

[The following list identifies federally listed or proposed U.S. species by State and County. It has been updated through September 1, 1997.]

Note: Species listed below with a status of both E and T are generally either endangered or threatened within the specified county. The assignment of two status designations for a species in a specific county is a function of the data set used to develop this list. For purposes of this permit, however, the obligation to assess the impact of storm water discharges on listed species does not vary based on which of the two statuses (e.g., endangered threatened) is assigned (see Addendum A Instructions). Designation of critical habitat (CH) does not mean that the county constitutes critical habitat, only that critical habitat has been designated for that species (see Addendum A Instructions).

State/County	Group name	Inverse name	Scientific name	Action/ Status
COLORADO				
ADAMS	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
ALAMOSA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
ARCHULETA	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
BACA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
BENT	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
BOULDER	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
	PLANTS	LADIES-TRESSES, UTE	Spiranthes diluvialis	L,T
CHAFFEE	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
CHEYENNE	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
CLEAR CREEK	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
CONEJOS	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
COSTILLA	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
CUSTER	BIRDS	FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
DELTA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
	FISHES	SQUAWFISH, COLORADO	Ptychocheilus lucius	L,CH
		SUCKER, RAZORBACK	Xyrauchen texanus	L,E,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, SPINELESS HEDGEHOG	Echinocereus triglochidiatus var. inermis	L,E
		CACTUS, UINTA BASIN HOOKLESS	Sclerocactus glaucus(=Echinocactus g., S. whipplei)	L,T
		WILD-BUCKWHEAT, CLAY-LOVING	Erigonum pelinophilum	L,E,CH
DOLORES	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
DOUGLAS	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
	INSECTS	SKIPPER, PAWNEE MONTANE	Hesperia leonardus (=pawnee) montana	L,T
EAGLE	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
EL PASO	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH

Key: L - Listed, P - Proposed, E - Endangered, T - Threatened, CH - Critical Habitat

IV. COUNTY/SPECIES LIST CONTINUED

The following list identifies federally listed or proposed U.S. species by State and County. It has been updated through September 1, 1997.

State/County	Group name	Inverse name	Scientific name	Action/ Status
FREMONT GARFIELD	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	BIRDS	OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
GRAND		FALCON, PEREGRINE	Falco peregrinus	L,E
	FISHES	SQUAWFISH, COLORADO	Ptychocheilus lucius	L,CH
		SUCKER, RAZORBACK	Xyrauchen texanus	L,E,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
GUNNISON	PLANTS	CACTUS, UINTA BASIN HOOKLESS	Sclerocactus glaucus(=Echinocactus g., S. whipplei)	L,T
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	PLANTS	BEARDTONGUE, PENLAND	Penstemon penlandii	L,E
		MILK-VETCH, OSTERHOUT	Astragalus osterhoutii	L,E
HINSDALE	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocneuma	L,E
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
HUERFANO	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocneuma	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
JACKSON		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
JEFFERSON		FALCON, PEREGRINE	Falco peregrinus	L,E
	PLANTS	PHACELIA, NORTH PARK	Phacelia formosula	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	INSECTS	SKIPPER, PAWNEE MONTANE	Hesperia leonardus (=pawnee) montana	L,T
KIOWA	PLANTS	LADIES'-TRESSES, UTE	Spiranthes diluvialis	L,T
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	LA PLATA	BIRDS	EAGLE, BALD	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
LAKE		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, KNOWLTON	Pediocactus knowltonii	L,E
	BIRDS	OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
LARIMER	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocneuma	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
LAS ANIMAS	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
LINCOLN		FALCON, PEREGRINE	Falco peregrinus	L,E
	FISHES	CHUB, BONYTAIL	Gila elegans	L,E,CH
		CHUB, HUMPBACK	Gila cypha	L,E,CH
		SQUAWFISH, COLORADO	Ptychocheilus lucius	L,CH
LOGAN		SUCKER, RAZORBACK	Xyrauchen texanus	L,E,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, SPINELESS HEDGEHOG	Echinocereus triglochidiatus var. inermis	L,E
		CACTUS, UINTA BASIN HOOKLESS	Sclerocactus glaucus(=Echinocactus g., S. whipplei)	L,T
MESA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	FISHES	CHUB, BONYTAIL	Gila elegans	L,E,CH
MOFFAT		CHUB, HUMPBACK	Gila cypha	L,E,CH

Key: L - Listed, P - Proposed, E - Endangered, T - Threatened, CH - Critical Habitat

IV. COUNTY/SPECIES LIST CONTINUED

The following list identifies federally listed or proposed U.S. species by State and County. It has been updated through September 1, 1997.

State/County	Group name	Inverse name	Scientific name	Action/ Status
MONTEZUMA	MAMMALS	SQUAWFISH, COLORADO	Ptychocheilus lucius	L,CH
		SUCKER, RAZORBACK	Xyrauchen texanus	L,E,CH
	BIRDS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
		EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	FISHES	SQUAWFISH, COLORADO	Ptychocheilus lucius	L,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, MESA VERDE	Sclerocactus mesae-verdae (=Pediocactus m.)	L,T
		MILK-VETCH, MANCOS	Astragalus humillimus	L,E
MONTROSE	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
		FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	MAMMALS	CACTUS, SPINELESS HEDGEHOG	Echinocereus triglochidiatus var. inermis	L,E
		CACTUS, UINTA BASIN HOOKLESS	Sclerocactus glaucus(=Echinocactus g.,S. whipplei)	L,T
	PLANTS	WILD-BUCKWHEAT, CLAY-LOVING	Eriogonum pelinophilum	L,E,CH
		EAGLE, BALD	Haliaeetus leucocephalus	L,T
	BIRDS	FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
MORGAN	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		LADIES'-TRESSES, UTE	Spiranthes diluvialis	L,T
	PLANTS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
		BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FISHES	TROUT, GREENBACK CUTTHROAT	L,T
PARK	INSECTS	SKIPPER, PAWNEE MONTANE	Hesperia leonardus (=pawnee) montana	L,T
		MUSTARD, PENLAND ALPINE FEN	Eutrema penlandii	L,T
	PLANTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		EAGLE, BALD	Haliaeetus leucocephalus	L,T
	BIRDS	OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
		EAGLE, BALD	Haliaeetus leucocephalus	L,T
	FISHES	SQUAWFISH, COLORADO	Ptychocheilus lucius	L,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	BLADDERPOD, DUDLEY BLUFFS	Lesquerella congesta	L,T
RIO BLANCO	BIRDS	TWINPOD, DUDLEY BLUFFS	Physaria obcordata	L,T
		EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
RIO GRANDE	BIRDS	OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
		BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
	INSECTS	OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
		BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
ROUTT	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
		BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, SPINELESS HEDGEHOG	Echinocereus triglochidiatus var. inermis	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
SAGUACHE	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
		BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
SAN JUAN	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
		BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, SPINELESS HEDGEHOG	Echinocereus triglochidiatus var. inermis	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		EAGLE, BALD	Haliaeetus leucocephalus	L,T
SEDGWICK	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, SPINELESS HEDGEHOG	Echinocereus triglochidiatus var. inermis	L,E
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E

Key: L - Listed, P - Proposed, E - Endangered, T - Threatened, CH - Critical Habitat

IV. COUNTY/SPECIES LIST CONTINUED

The following list identifies federally listed or proposed U.S. species by State and County. It has been updated through September 1, 1997.

State/County	Group name	Inverse name	Scientific name	Action/ Status
SUMMIT	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	PLANTS	MUSTARD, PENLAND ALPINE FEN	Eutrema penlandii	L,T
TELLER	BIRDS	FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	INSECTS	SKIPPER, PAWNEE MONTANE	Hesperia leonardus (=pawnee) montana	L,T
WASHINGTON	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
WELD	BIRDS	CRANE, WHOOPING	Grus americana	L,E,CH
		EAGLE, BALD	Haliaeetus leucocephalus	L,T
	PLANTS	LADIES'-TRESSES, UTE	Spiranthes diluvialis	L,T
YUMA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T

ADDENDUM B - HISTORIC PROPERTIES (RESERVED)

Instructions related to historic preservation have not been included in the permit at this time. EPA may modify the permit to include such provisions at a later date. This does not relieve applicants or permittees of their responsibility to comply with applicable State, Tribal or local laws for the protection of historic properties.

NPDES
FORM



United States Environmental Protection Agency
Washington, DC 20460

**Notice of Intent (NOI) for Storm Water Discharges Associated with
CONSTRUCTION ACTIVITY Under a NPDES General Permit**

Submission of this Notice of Intent constitutes notice that the party identified in Section I of this form intends to be authorized by a NPDES permit issued for storm water discharges associated with construction activity in the State/Indian Country Land identified in Section II of this form. Submission of this Notice of Intent also constitutes notice that the party identified in Section I of this form meets the eligibility requirements in Part I.B. of the general permit (including those related to protection of endangered species determined through the procedures in Addendum A of the general permit), understands that continued authorization to discharge is contingent on maintaining permit eligibility, and that implementation of the Storm Water Pollution Prevention Plan required under Part IV of the general permit will begin at the time the permittee commences work on the construction project identified in Section II below. IN ORDER TO OBTAIN AUTHORIZATION, ALL INFORMATION REQUESTED MUST BE INCLUDED ON THIS FORM. SEE INSTRUCTIONS ON BACK OF FORM.

I. Owner/Operator (Applicant) Information

Name: _____ Phone: _____
Address: _____ Status of Owner/Operator: ☐
City: _____ State: _____ Zip Code: _____

II. Project/Site Information

Is the facility located on Indian
Country Lands?
Yes ☐ No ☐

Project Name: _____
Project Address/Location: _____
City: _____ State: _____ Zip Code: _____
Latitude: _____ Longitude: _____ County: _____

Has the Storm Water Pollution Prevention Plan (SWPPP) been prepared? Yes ☐ No ☐

Optional: Address of location of
SWPPP for viewing ☐ Address in Section I above ☐ Address in Section II above ☐ Other address (if known) below:

SWPPP Address: _____ Phone: _____
City: _____ State: _____ Zip Code: _____

Name of Receiving Water: _____

Month Day Year

Month Day Year

Estimated Construction Start Date Estimated Completion Date

Estimate of area to be disturbed (to nearest acre): _____

Estimate of Likelihood of Discharge (choose only one):

1. ☐ Unlikely 3. ☐ Once per week 5. ☐ Continual
2. ☐ Once per month 4. ☐ Once per day

Based on instruction provided in Addendum A of the permit, are
there any listed endangered or threatened species, or designated
critical habitat in the project area?

Yes ☐ No ☐

I have satisfied permit eligibility with regard to protection of
endangered species through the indicated section of Part I.B.3.e.(2)
of the permit (check one or more boxes):

(a) ☐ (b) ☐ (c) ☐ (d) ☐

III. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: _____ Date: _____

Signature: _____

**Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity to be Covered Under a NPDES Permit****Who Must File a Notice of Intent Form**

Under the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et seq.; the Act), except as provided by Part I.B.3 the permit, Federal law prohibits discharges of pollutants in storm water from construction activities without a National Pollutant Discharge Elimination System Permit. Operator(s) of construction sites where 5 or more acres are disturbed, smaller sites that are part of a larger common plan of development or sale where there is a cumulative disturbance of at least 5 acres, or any site designated by the Director, must submit an NOI to obtain coverage under an NPDES Storm Water Construction General Permit. If you have questions about whether you need a permit under the NPDES Storm Water program, or if you need information as to whether a particular program is administered by EPA or a State agency, write to or telephone the Notice of Intent Processing Center at (703) 931-3230.

Where to File NOI Form

NOIs must be sent to the following address:

Storm Water Notice of Intent (4203)
USEPA
401 M. Street, SW
Washington, D.C. 20460

Do not send Storm Water Pollution Prevention Plans (SWPPPs) to the above address. For overnight/express delivery of NOIs, please include the room number 2104 Northeast Mall and phone number (202) 260-9541 in the address.

When to File

This form must be filed at least 48 hours before construction begins.

Completing the Form

OBTAIN AND READ A COPY OF THE APPROPRIATE EPA STORM WATER CONSTRUCTION GENERAL PERMIT FOR YOUR AREA. To complete this form, type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks (abbreviate if necessary to stay within the number of characters allowed for each item). Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, call the Notice of Intent Processing Center at (703) 931-3230.

Section I. Facility Owner/Operator (Applicant) Information

Provide the legal name, mailing address, and telephone number of the person, firm, public organization, or any other entity that meet either of the following two criteria: (1) they have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) they have the day-to-day operational control of those activities at the project necessary to ensure compliance with SWPPP requirements or other permit conditions. Each person that meets either of these criteria must file this form. Do not use a colloquial name. Correspondence for the permit will be sent to this address.

Enter the appropriate letter to indicate the legal status of the owner/operator of the project: F = Federal; S = State; M = Public (other than federal or state); P = Private.

Section II. Project/Site Information

Enter the official or legal name and complete street address, including city, county, state, zip code, and phone number of the project or site. If it lacks a street address, indicate with a general statement the location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for permit coverage to be granted.

The applicant must also provide the latitude and longitude of the facility in degrees, minutes, and seconds to the nearest 15 seconds. The latitude and longitude of your facility can be located on USGS quadrangle maps. Quadrangle maps can be obtained by calling 1-800 USA MAPS. Longitude and latitude may also be obtained at the Census Bureau Internet site: <http://www.census.gov/cgi-bin/gazetteer>.

Latitude and longitude for a facility in decimal form must be converted to degrees, minutes and seconds for proper entry on the NOI form. To convert decimal latitude or longitude to degrees, minutes, and seconds, follow the steps in the following example.

Convert decimal latitude 45.1234567 to degrees, minutes, and seconds.

- 1) The numbers to the left of the decimal point are degrees.
- 2) To obtain minutes, multiply the first four numbers to the right of the decimal point by 0.006. $1234 \times 0.006 = 7.404$.
- 3) The numbers to the left of the decimal point in the result obtained in step 2 are the minutes: 7.
- 4) To obtain seconds, multiply the remaining three numbers to the right of the decimal from the result in step 2 by 0.06: $404 \times 0.06 = 24.24$. Since the numbers to the right of the decimal point are not used, the result is 24".
- 5) The conversion for 45.1234 = 45° 7' 24".

Indicate whether the project is on Indian Country Lands.

Indicate if the Storm Water Pollution Prevention Plan (SWPPP) has been developed. Refer to Part IV of the general permit for information on SWPPPs. To be eligible for coverage, a SWPPP must have been prepared.

Optional: Provide the address and phone number where the SWPPP can be viewed if different from addresses previously given. Check appropriate box.

Enter the name of the closest water body which receives the project's construction storm water discharge.

Enter the estimated construction start and completion dates using four digits for the year (i.e. 05/27/1998).

Enter the estimated area to be disturbed including but not limited to: grubbing, excavation, grading, and utilities and infrastructure installation. Indicate to the nearest acre; if less than 1 acre, enter "1." Note: 1 acre = 43,560 sq. ft.

Indicate your best estimate of the likelihood of storm water discharges from the project. EPA recognizes that actual discharges may differ from this estimate due to unforeseen or chance circumstances.

Indicate if there are any listed endangered or threatened species, or designated critical habitat in the project area.

Indicate which Part of the permit that the applicant is eligible with regard to protection of endangered or threatened species, or designated critical habitat.

Section III. Certification

Federal Statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner of the proprietor, or

For a municipality, state, federal, or other public facility: by either a principal executive or ranking elected official. An unsigned or undated NOI form will not be granted permit coverage.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 3.7 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Director, OPPE Regulatory Information Division (2137), U.S. Environmental Protection Agency, 401 M Street, SW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

NPDES
FORMUnited States Environmental Protection Agency
Washington, DC 20460**Notice of Termination (NOT) of Coverage Under a NPDES General Permit for Storm Water Discharges Associated with Industrial Activity**

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge storm water associated with industrial activity under the NPDES program. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.

I. Permit InformationNPDES Storm Water
General Permit Number: _____Check Here if You are No Longer
the Operator of the Facility: ☐Check Here if the Storm Water
Discharge is Being Terminated: ☐**II. Facility Operator Information**

Name: _____ Phone: _____

Address: _____

City: _____ State: _____ ZIP Code: _____

III. Facility/Site Location Information

Name: _____

Address: _____

City: _____ State: _____ ZIP Code: _____

Latitude: _____ Longitude: _____ Quarter: _____ Section: _____ Township: _____ Range: _____

IV. Certification: I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that are authorized by a NPDES general permit have been eliminated or that I am no longer the operator of the facility or construction site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violations of this permit or the Clean Water Act.

Print Name: _____ Date: _____

Signature: _____

Instructions for Completing Notice of Termination (NOT) Form**Who May File a Notice of Termination (NOT) Form**

Permittees who are presently covered under an EPA-issued National Pollutant Discharge Elimination System (NPDES) General Permit (including the 1995 Multi-Sector Permit) for Storm Water Discharges Associated with Industrial Activity may submit a Notice of Termination (NOT) form when their facilities no longer have any storm water discharges associated with industrial activity as defined in the storm water regulations at 40 CFR 122.26(b)(14), or when they are no longer the operator of the facilities.

For construction activities, elimination of all storm water discharges associated with industrial activity occurs when disturbed soils at the construction site have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with industrial activity from the construction site that are authorized by a NPDES general permit have otherwise been eliminated. Final stabilization means that all soil-disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of nrap, gabions, or geotextiles) have been employed.

Where to File NOT Form

Send this form to the the following address:

Storm Water Notice of Termination (4203)
401 M Street, S.W.
Washington, DC 20460

Completing the Form

Type or print, using upper-case letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, telephone or write the Notice of Intent Processing Center at (703) 931-3230.

Instructions - EPA Form 3510-7
Notice of Termination (NOT) of Coverage Under The NPDES General Permit
for Storm Water Discharges Associated With Industrial Activity

Section I Permit Information

Enter the existing NPDES Storm Water General Permit number assigned to the facility or site identified in Section III. If you do not know the permit number, telephone or write your EPA Regional storm water contact person.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box:

If there has been a change of operator and you are no longer the operator of the facility or site identified in Section III, check the corresponding box.

If all storm water discharges at the facility or site identified in Section III have been terminated, check the corresponding box.

Section II Facility Operator Information

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same name as the facility. The operator of the facility is the legal entity which controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Section III Facility/Site Location Information

Enter the facility's or site's official or legal name and complete address, including city, state and ZIP code. If the facility lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site.

Section IV Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipality, State, Federal, or other public facility: by either a principal executive officer or ranking elected official.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

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12/88

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SECTION 02210

GRADING
12/88

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 422	(1963; R 1990) Particle-Size Analysis of Soils
ASTM D 1556	(1990; R 1996) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.))
ASTM D 2167	(1994) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2216	(1992) Laboratory Determination of Water (Moisture) Content of Soil, and Rock
ASTM D 2487	(1993) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2488	(1993) Description and Identification of Soils(Visual-Manual Procedure)
ASTM D 2922	(1996) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(1996) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 4318	(1996) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

1.2 UNIT PRICE

1.2.1 MEASUREMENT

1.2.1.1 Excavation

The unit of measurement for excavation will be the cubic yard computed by the average end-area method from cross sections taken before and after the excavation and borrow operations. The yardage paid for will be the number

of cubic yards of material, measured in its original position and removed from the excavation and borrow areas, including the excavation for ditches, gutters, and channel changes, which material is acceptably utilized or disposed of as herein specified. The measurement will include the excavation below grade of unsuitable material where ordered, and allowance will be made on the same basis for selected backfill ordered as replacement. The measurement will not include the yardage excavated without authorization or the yardage of any material used for other than directed purposes. Yardage of overburden stripped from borrow pits, unless used as borrow material, will not be paid for. The measurement will not include the yardage of any excavation performed prior to the taking of elevations and measurements of the undisturbed grade.

1.2.1.2 Topsoil

Separate excavation, hauling, and spreading or piling of topsoil and all miscellaneous operations attendant thereto will be considered subsidiary obligations of the Contractor, covered under the contract unit price for excavation.

1.2.1.3 Overhaul

The unit of measurement for overhaul will be the station yard. The number of station yards of overhaul to be paid for will be the product of the number of cubic yards of overhaul materials, measured in the original position, multiplied by the overhaul distance measured in stations of 100 feet. The overhaul distance will be the distance in stations between the center of volume of the overhauled material in its original position and the center of volume after placing, minus the free-haul distance in stations. The haul distance will be measured along the shortest route determined as feasible and satisfactory.

1.2.2 PAYMENT

1.2.2.1 Excavation

Excavation will be paid for at the contract unit price per cubic yard for "Excavation."

1.2.2.2 Overhaul

Overhaul will be paid for at the contract unit price per station yard for "Overhaul."

1.3 DEFINITIONS

1.3.1 Suitable Materials

Suitable materials are materials that classify according to ASTM D 2487 as GW, GP, GC, GM, SW, [SP,]SC, SM, CL, [CH,]and ML. Lime and flyash shall also be considered as suitable materials when used as stabilizing agents.

1.3.2 Unsuitable Materials

Unsuitable materials include all materials that are not defined above as suitable materials. In addition, unsuitable materials are materials that classify according to ASTM D 2487 as MH, OH, [CH,]Pt, [SP,]and OL. Unsuitable materials also include all material that contains debris, refuse, roots, organic matter, frozen material, fine grained sedimentary

rocks (i.e., shale, claystone, siltstone, mudstone, and marl) even though they may be intensely weathered, contamination from hazardous, toxic, biological or radiological substances, stone having a maximum dimension larger than 3 inches in any dimension, or other materials that are determined by the Contracting Officer as unsuitable for providing a stable subgrade or stable foundation for pavement. Otherwise suitable material which has excess moisture content shall not be classified as unsuitable material unless it cannot be dried by manipulation, aeration, or blending with other materials as determined by the Contracting Officer.

1.3.3 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic.

1.3.4 Expansive Soils

Expansive soils are defined as soils that have a plasticity index greater than 24 and a liquid limit greater than 49 when tested in accordance with ASTM D 4318.

1.3.5 Non-expansive Soils

Non-expansive soils are defined as soils with a plasticity index less than or equal to 24 and a liquid limit less than or equal to 49 when tested in accordance with ASTM D 4318.

1.3.6 Overhaul

Overhaul is the authorized transportation of suitable excavation or borrow materials in excess of the free-haul limit of [_____] stations. Overhaul is the product of the quantity of materials hauled beyond the free-haul limit and the distance such materials are hauled beyond the free-haul limit, expressed in station yards.

1.3.7 Acceptable Topsoil

Acceptable topsoil is defined as selectively excavated natural, friable soil that is representative of soils in the vicinity that produce heavy growths of crops, grass or other vegetation and is reasonably free from underlying subsoil, clay lumps, objectionable weeds, litter, brush, matted roots, toxic substances or any material that might be harmful to plant growth or be a hindrance to grading, planting or maintenance operations. Soil from ditch bottoms, drained ponds, eroded areas, or soil which is excessively wet or saturated is not acceptable. Topsoil shall not contain more than five percent by volume of stones, stumps or other objects larger than 1 inch in any dimension for field seeded areas and 1/2 inch in any dimension for lawn seeded areas. [Topsoil shall not be excessively acid or alkaline (pH value 6.0 to 7.5). Topsoil shall contain 5 to 20 percent organic matter as determined by the organic carbon 6A chemical analysis method described in USDA Soil Survey Investigation Report No. 1.] Topsoil shall be approved by the Contracting Officer. [See Section 02921 SEEDING for additional requirements.]

1.3.8 Spot Subgrade Reinforcement Material

Spot subgrade reinforcement material includes sound, tough, durable crushed

stone, slag or gravel, consisting of pieces varying from 1 inch to 3-1/2 inches in diameter, or other approved material, with necessary filler. When a finer material is necessary for filler, broken stone chips, screened gravel, or sand may be used to completely fill all voids.

1.3.9 Pavements

Pavements shall include all roads, walk areas, graveled parking or walk areas, or any other type of surfaced area for driving or walking.

1.3.10 Standard Frame and Grate or Cover

Standard frame and grate or cover shall mean heavy-duty type frame and grate or cover as a minimum.

1.3.11 Degree of Compaction

Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittal

Disposal Facility; G-[_____].

Location of disposal facility and appropriate documentation.

SD-07 Certificates

Field Testing Control

Qualifications of the commercial testing laboratory who will be performing all testing in accordance with paragraph FIELD TESTING CONTROL.

SD-06 Test Reports

Field Testing Control

Suitable Materials

Certified test reports and analysis certifying that the suitable materials proposed for use at the project site conform to the specified requirements, and for all tests conducted in accordance with paragraph FIELD TESTING CONTROL.

Borrow material; G-AE.

For each type of material[, with the exception of material reused from on-site excavation,] the following tests shall be performed:

Compaction curve, ASTM D 1557

Liquid limit, ASTM D 4318

Plastic limit, ASTM D 4318

Insitu moisture content, ASTM D 2216

Visual description of material, ASTM D 2488

Particle-size analysis, ASTM D 422

Soil classification, ASTM D 2487

PART 2 PRODUCTS

2.1 BORROW MATERIAL

Borrow material shall be selected to meet requirements and conditions of the particular fill for which it is to be used. Necessary clearing, grubbing, disposal of debris, and satisfactory drainage of borrow pits shall be performed by the Contractor as incidental operations to the borrow excavation.

2.1.1 Selection

Borrow materials shall be obtained from [the borrow areas shown][or] [sources outside the limits of Government-controlled land][or][sources within the limits of Government-controlled land, subject to approval]. Borrow materials shall be subject to approval. [Borrow material from approved sources on Government-controlled land may be obtained without payment of royalties. Unless specifically provided, no borrow shall be obtained within the limits of the project site without prior written approval.][The source of borrow material shall be the Contractor's responsibility. Unless otherwise provided in the contract, the Contractor shall obtain from the owners the right to procure material, shall pay all royalties and other charges involved, and shall bear all the expense of developing the sources, including rights-of-way for hauling.][Spot subgrade reinforcement material [and ____] shall be obtained from approved sources outside the limits of Government-controlled land at the Contractor's expense.]

2.1.2 Borrow Pits

[The Contractor shall notify the Contracting Officer sufficiently in advance of the opening of any excavation or borrow pit to permit elevations and measurements to be taken of the undisturbed ground surface.] Except as otherwise permitted, borrow pits shall be excavated to afford adequate drainage. Overburden and other spoil material shall be disposed of or used for special purposes. Borrow pits shall be neatly trimmed [and left in such shape as will facilitate taking accurate measurements] after the excavation is completed.

PART 3 EXECUTION

3.1 CONSERVATION OF TOPSOIL

Topsoil shall be removed [_____] inches, without contamination with subsoil, and stockpiled convenient to areas for later application or at locations specified. Topsoil shall be removed and stored separate from other excavated materials and piled free of roots, stones, and other undesirable materials. Any surplus of topsoil from excavations and grading shall be [stockpiled in locations indicated] [removed from the site].

3.2 EXCAVATION

Excavation of every description, regardless of material encountered, within the grading limits of the project shall be performed to the lines and grades indicated [including removal of existing bituminous surface course, concrete pavement and integral curb, pavement subcourses to the full depth, concrete walk, culverts, storm drains, subdrains, and storm drain and subdrain structures]. Suitable excavated material shall be transported to and placed in fill areas within the limits of the work. Unsuitable material encountered within the limits of the work shall be excavated below the grade shown and replaced with suitable material as directed. Such material excavated and the selected material ordered as replacement will be paid for by an equitable adjustment of the contract price under the clause of the CONTRACT CLAUSES of the contract entitled "Changes." Unsuitable material [and surplus excavated material not required for fill] shall be disposed of by the Contractor at his own expense and responsibility outside the limits of Government-controlled land. [Surplus excavated material not required for fill shall be disposed of by the Contractor in [designated waste areas] [areas approved for surplus material storage at his own expense and responsibility outside the limits of Government-controlled land].] [in designated [waste] area[s] [or in areas approved for surplus material storage] [at his own expense and responsibility outside of the limit of Government-controlled lands]]. [Disposal of materials outside Government-controlled lands shall be in accordance with federal, state, and local regulations. The location of any disposal facility located outside of the limit of Government-controlled lands shall be submitted to the Contracting Officer prior to removal from the project site. The Contractor shall submit documentation from the disposal facility to verify that it is licensed to accept the material. No material shall be removed from the project site without prior approval from the Contracting Officer. The Contractor shall notify the Contracting Officer if any material to be disposed of is found to contain hazardous, toxic, biological or radiological substances.] During construction, excavation and filling shall be performed in a manner and sequence that will [utilize all suitable material from required excavation prior to obtaining material from borrow and will] provide drainage at all times. [Material required for fills in excess of that produced by excavation within the grading limits shall be excavated from [the borrow areas indicated] [or from other] [approved areas selected by the Contractor, and approved by the Contracting Officer as specified below]].

3.3 EXCAVATION OF DITCHES

Ditches shall be cut accurately to the cross sections and grades indicated. All roots, stumps, rock and foreign matter in the sides and bottom of ditches shall be cut to conform to the slope, grade, and shape of the

section shown. Care shall be taken not to excavate ditches below the grades indicated. Excessive ditch excavation shall be backfilled to grade with suitable, thoroughly compacted material as directed. All ditches excavated under this section shall be maintained until final acceptance of the work. Suitable material excavated from ditches shall be placed in fill areas as directed. Unsuitable and excess excavated material shall be disposed of as specified above. No excavated material shall be deposited closer than 3 feet from the edges of the ditches.

3.4 UTILIZATION OF EXCAVATED MATERIALS

Suitable material removed from required excavation under this section [and any excess material from building excavation] shall be utilized in the formation of embankments, [subgrades,][shoulders,] slopes, [bedding,] backfill for [culverts and other] structures, and for such other purposes as directed. No excavated material shall be wasted without the authorization of the Contracting Officer. Material authorized to be wasted shall be disposed of as directed and in such manner as not to obstruct the flow characteristics of any stream or to impair the efficiency or appearance of any structure. No excavated material shall be deposited at any time in a manner that may endanger a partly finished structure by direct pressure, by overloading banks contiguous to the operations, or that may in any other way be detrimental to the completed work.

3.5 BACKFILL ADJACENT TO STRUCTURES

Backfill adjacent to structures shall be placed and compacted uniformly in such manner as to prevent wedging action or eccentric loading upon or against the structures. Slopes bounding or within areas to be backfilled shall be stepped or serrated to prevent sliding of the fill. During backfilling operations and in the formation of embankments, equipment that will overload the structure in passing over and compacting these fills shall not be used. [Backfill for [culverts,][storm drains][and] [subdrains], including the bedding, shall conform to the additional requirements as specified in Section 02630 STORM-DRAINAGE SYSTEM and Section 02620 SUBDRAINAGE SYSTEM.] Backfill for structures [other than [culverts][storm drains][and][subdrains]] shall conform to the additional requirements in Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

3.6 PREPARATION OF GROUND SURFACE FOR FILL

All vegetation, such as roots, brush, heavy sods, heavy growth of grass, and all decayed vegetable matter, rubbish, and other unsuitable material within the area upon which fill is to be placed, shall be stripped or otherwise removed before the fill is started. In no case will unsuitable material remain in or under the fill area. Stumps, logs and roots more than 1-1/2 inch in diameter shall be excavated and removed to a depth not less than 18 inches below the original ground surface. Sloped ground surfaces steeper than one vertical to four horizontal on which fill is to be placed shall be plowed, stepped, or broken up, as directed, in such manner that the fill material will bond with the existing surface. Prepared surfaces on which compacted fill is to be placed shall be wetted or dried as may be required to obtain the specified moisture content and density.

3.7 FILLS AND EMBANKMENTS

Fills and embankments herein designated as fills shall be constructed at

the locations and to lines and grades indicated on the drawings. The completed fill shall correspond to the shape of the typical sections shown on the drawings and shall meet the requirements of the particular case. Suitable material removed from the excavation shall be used in forming the necessary fill. Where otherwise suitable material is too wet, it shall be aerated or dried to provide the moisture content specified for compaction. The material shall be placed in successive horizontal layers of 8 inches to 12 inches in loose depth for the full width of the cross section, and compacted. Each layer shall be compacted before the overlaying lift is placed.

3.8 COMPACTION

Compaction shall be accomplished by means specified and to the following densities for various parts of the work. Deficiencies in construction shall be corrected by the Contractor at no additional cost to the Government.

3.8.1 Over-all or Overlot Areas

Each layer of fills constructed under this section [except for topsoil] shall be compacted to at least 90 percent of the maximum density as determined in paragraph Degree of Compaction. Cohesive soils shall be at a moisture content between [1][_____] percent below and [4][_____] percent above optimum moisture when compacted. Cohesionless soils shall be compacted at a moisture content as required to facilitate compaction without bulking.

3.8.2 Areas to Receive [Pavements][Railroads]

All fills for paved areas shall be compacted as specified for OVER-ALL OR OVERLOT AREAS, with the following exception. The upper layer forming the subgrade for [pavements][railroads] in both cut and fill areas, shall be compacted to at least 95 percent of maximum density as determined in paragraph Degree of Compaction.

3.8.2.1 Subgrade Preparation

The subgrade shall be shaped to line, grade and cross section with approved compaction equipment so as to provide a minimum compacted subgrade thickness of [_____] inches. This operation shall include any reshaping, aeration, wetting, or drying required. [The subgrade in cut sections shall be scarified and excavated for the full depth of compacted subgrade indicated on the drawings, and the excavated material shall be windrowed and bladed successively until thoroughly blended, then relaid and compacted. The subgrade in fill sections shall be windrowed and bladed successively until thoroughly blended, then compacted.] [Expansive cohesive soils shall be at a moisture content between 3 and 8 percent above optimum moisture when compacted.] The moisture content of [non-expansive] cohesive soils shall be adjusted within the range 1 percent below to 3 percent above optimum moisture when compacted. Cohesionless soils shall be compacted as required to facilitate compaction without bulking. All unsuitable material shall be removed and replaced with suitable material from excavation [or borrow] or, if so directed, with spot subgrade reinforcement material, all as approved by the Contracting Officer. Spot subgrade reinforcement, if required, will be paid for by an equitable adjustment of the contract price under the clause Entitled "Changes" of the CONTRACT CLAUSES. All boulders or ledge stone encountered in the excavation shall be removed or broken off to a depth of not less than 6 inches below the subgrade. The resulting

area and all other low sections, holes, or depressions shall be brought to the required grade with suitable material and the entire subgrade shaped to line, grade and cross section and thoroughly compacted as herein provided. [Subgrade compaction shall be extended to include the shoulders.]

3.8.2.2 Spot Subgrade Reinforcement

The use of spot subgrade reinforcement material shall be at the direction of and subject to the approval of the Contracting Officer. Unsuitable subgrade materials shall be removed, the bottom of the resulting excavation shaped uniformly and compacted firmly to the density specified for subgrade, and the required provisions for adequate drainage shall be made. The subgrade reinforcement material shall then be placed in the prepared excavation, in layers of not more than 8 inches, which shall be spread and rammed until level with the surrounding subgrade surface. The voids shall then be filled with necessary finer selected material and the area rolled, or tamped if inaccessible to the roller. The filling and rolling or tamping shall be continued until the entire mass is thoroughly compacted to not less than the density of the surrounding or adjacent areas. The surface shall be finished to conform accurately to the grade and cross section shown on the drawings.

3.9 PLACING TOPSOIL

All ground areas disturbed by construction under this contract and not built over, paved or otherwise surfaced shall be topsoiled.

3.9.1 Clearing

Prior to placing topsoil, vegetation shall be removed from the area and the ground surface cleared of all other materials that would hinder proper grading, tillage or subsequent maintenance operations.

3.9.2 Grading

Previously constructed grades shall be repaired if necessary so that the areas to be topsoiled shall conform to the section indicated on the drawings upon completion of topsoil placement.

3.9.3 Tillage

Subsequent to the above grading, the areas to be top-soiled shall be thoroughly scarified by approved means to a depth of at least 3 inches for bonding of topsoil with subsoil. The work shall be performed only during periods when beneficial results are likely to be obtained. When conditions are such, by reason of drought, excessive moisture, or other factors, that satisfactory results are not likely to be obtained, the work will be stopped by the Contracting Officer and shall be resumed only when directed.

Undulations or irregularities in the surface that would interfere with further construction operations or maintenance shall be leveled before the next specified operation.

3.9.4 Placing Topsoil

Topsoil shall be uniformly distributed on the designated areas and evenly spread to a minimum thickness of [4][_____] inches~\ . Spreading shall be performed in such manner that planting can proceed with little additional soil preparation or tillage. The resulting surface shall meet the finish surface requirements specified in the following paragraph: FINISHED

EXCAVATION, FILLS AND EMBANKMENTS. Topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to proper grading or the proposed planting.

3.10 FIELD TESTING CONTROL

3.10.1 Sampling and Testing

All quality control sampling and testing shall be performed by the Contractor in accordance with Section 01451 CONTRACTOR QUALITY CONTROL and as specified herein.

3.10.2 Moisture-Density Determinations

Tests for determination of maximum density and optimum moisture shall be performed by the Contractor in accordance with ASTM D 1557, except that a mechanical tamper may be used provided the results are correlated with those obtained with the referenced hand tamper. Samples shall be representative of the materials to be placed. An optimum moisture-density curve shall be obtained for each principal type of material or combination of materials encountered or utilized. Results of these tests shall be the basis of control for compaction. The above testing shall include Atterberg limits, grain size determinations and specific gravity. A copy of these tests shall be furnished to the Contracting Officer with the construction quality control daily report.

3.10.3 Density Control

The Contractor shall adequately control his compaction operations by tests made in accordance with any of the following methods: ASTM D 1556, ASTM D 2167, or ASTM D 2922 and ASTM D 3017 to insure placement of materials within the limits of densities specified. [The Contractor shall obtain a service permit to use radiation producing machinery or radioactive materials in accordance with Section 01400 SPECIAL SAFETY REQUIREMENTS FOR DEMOLITION AND RENOVATION.] When ASTM D 2922 is used, the calibration curves shall be checked, and adjusted if necessary, using the sand cone method as described in paragraph "Calibration" of ASTM D 2922. ASTM D 2922 results in a wet unit weight of soil and when using this method, ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with the density calibration checks as described in ASTM D 3017. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job, on each different type of material encountered, at intervals as directed by the Contracting Officer. If ASTM D 2922 is used for field density control, there should be at least one test performed according to ASTM D 1556 per every 10 tests performed according to ASTM D 2922-\ for correlation of test results. One test shall be made for each [3,000][_____] sq yds. or less for each layer of specified depth, except areas to receive pavements, for which one test shall be made for each [1,000][_____] sq yds or less for each layer. Additional tests shall be made as necessary. All test results shall be made available to the Contracting Officer. Acceptance tests may be made by the Government for verification of compliance; however, the Contractor shall not depend on such tests for his control of operations. Deficiencies in construction shall be corrected by the Contractor at no additional cost to the Government.

3.11 FINISHED EXCAVATION, FILLS, AND EMBANKMENTS

All areas covered by the project, including excavated and filled sections and adjacent transition areas, shall be uniformly smooth graded. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from either blade-grader or scraper operations, except as otherwise specified. The finished surface shall be not more than 0.15 foot above or below the established grade or approved cross section and shall be free of depressed areas where water would pond. [All ditches shall be finished so as to drain readily.] The surface of embankments or excavated areas for road construction or other areas to be paved on which a base course or pavement is to be placed shall not vary more than 0.05 foot from the established grade and approved cross section.

3.12 PROTECTION

During construction, embankments and excavations shall be kept shaped and drained. Ditches and drains along the subgrade shall be maintained in such manner as to drain effectively at all times. Where ruts occur in the subgrade, the subgrade shall be brought to grade, reshaped if required, and recompacted prior to the placing of surfacing. The storage or stockpiling of materials on the subgrade will not be permitted. No surfacing shall be laid until the subgrade has been checked and approved, and in no case shall any surfacing be placed on a muddy subgrade or on one containing frost. Newly graded areas shall be protected from traffic and from erosion, and any settlement or washing away that may occur from any cause, prior to acceptance, shall be repaired and grades reestablished to the required elevations and slopes. All work shall be conducted in accordance with the environmental protection requirements of the contract.

3.12.1 Protection of Existing Service Lines and Utilities Structures

Existing utility lines that are shown on the drawings, or the locations of which are made known to the Contractor prior to excavation that are to be retained, [as well as utility lines constructed during excavation operations,] shall be protected from damage during excavation and backfilling, and if damaged, shall be repaired by the Contractor at his expense. In the event that the Contractor damages any existing utility lines that are not shown, or the locations of which are not made known to the Contractor, report thereof shall be made immediately to the Contracting Officer. If determined that repairs are to be made by the Contractor, such repairs will be made in accordance with the clause Entitled "Changes" of the CONTRACT CLAUSES. [When utility lines that are to be removed or relocated are encountered within the area of operations, the Contractor shall notify the Contracting Officer in ample time for the necessary measures to be taken to prevent interruption of the service.]

3.13 ADJUSTMENT OF EXISTING STRUCTURES

All manholes, valve boxes, or inlets of any nature within the project that do not conform to the new finish grade in either surfaced or unsurfaced areas shall be adjusted to the new finish grade. Where inlets, manholes, or valve boxes fall within a surfaced or unpaved roadway or parking, the existing frames and cover shall be removed and replaced with a heavy-duty frame and cover. The structure shall be adjusted as needed to fit the new conditions. All structures shall be of a type suitable for the intended use and shall conform to the requirements of the applicable section of these specifications.

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SECTION 02440

TRAFFIC SIGNS

03/00

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 209 (1996) Aluminum and Aluminum-Alloy Sheet and Plate

ASTM D 4956 (1995) Retroreflective Sheeting for Traffic Control

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) STANDARD

ANSI D6.1e (1988, Rev 3) Manual on Uniform Traffic Control Devices for Streets and Highways

1.2 SUBMITTALS (NOT USED)

1.3 GENERAL

All sign faces shall conform to ANSI D6.1e.

PART 2 PRODUCTS

2.1 SIGN POSTS

2.1.1 Steel Flanged Channel Section (U-Shape)

Steel posts shall be fabricated from steel conforming to ASTM A 36 and shall have a minimum yield strength of 30 ksi and a minimum tensile strength of 50 ksi. Steel posts shall have 5/16 to 3/8 inch diameter holes spaced at 1 or 2 inch centers punched or drilled along the centerline of the web prior to galvanizing for the entire length of the post. Posts shall be galvanized in accordance with ASTM A 123.

2.2 ALUMINUM SIGN PANELS

Aluminum sign panels shall conform to ASTM B 209, alloy no.-temper 6061-T6 or 5052-H38. The blanks shall be free from laminations, blisters, open seams, pits, holes, other defects that may affect their appearance or use. The thickness shall be uniform and the blank commercially flat.

2.3 RETROREFLECTIVE SHEETING

Retroreflective sheeting shall conform to ASTM D 4956, Type I, II, III, IV, V, or VI. Type I retroreflective sheeting shall conform to ASTM D 4956,

except the minimum coefficients of retroreflection for brown type I sheeting shown in Table I of ASTM D 4956 are amended as follows: 2.0 cd/fc/ft² at 0.2 degrees observation angle and -4 degrees entrance angle, 1.0 cd/fc/ft² at 0.2 degrees observation angle and +30 degrees entrance angle and at 0.5 degrees observation angle and -4 degrees entrance angle, and 0.5 cd/fc/ft² at 0.5 degrees observation angle and +30 degrees entrance angle. All retroreflective sheeting shall have a precoated adhesive which will permanently adhere to the sign panel surface.

2.4 HARDWARE

Bolts, nuts and metal washers shall be either aluminum alloy or commercial quality steel, hot-dip galvanized or cadmium plated after fabrication. Fiber washers shall be of commercial quality.

PART 3 EXECUTION

3.1 GENERAL

Insulating material shall be placed to prevent contact between aluminum and steel material.

3.2 SIGN POSTS

Steel sign posts shall either be driven with a suitable driving head or set in drilled or punched holes. Any posts damaged during driving or otherwise shall be replaced at no additional cost to the Government. [Sign posts shall be painted in accordance with Section 09900 PAINTING, GENERAL. Color shall be as indicated in Section 09915 COLOR SCHEDULE.]

3.3 SIGN PANELS

Clean, degrease and etch the face of metal panels using methods recommended by the retroreflective sheeting manufacturer. After cleaning and degreasing, retroreflective sheeting material shall be applied to the sign panels as recommended by the manufacturer. Shearing, cutting and punching shall be performed prior to preparing the blanks for application of reflective material. Holes shall not be field drilled in any part of the panel. [The back side of all sign panels shall be stamped with the month and year that the sign was manufactured. The date shall be located on the lower right side of the back of the sign panel and shall be approximately 1/4 inch high. The date shall be stamped into the sign panel material for a permanent record.] [The backs of sign panels shall be painted in accordance with Section 09900 PAINTING, GENERAL. Color shall be as indicated in Section 09915 COLOR SCHEDULE.] Any damaged sign panels shall be replaced at no additional cost to the Government.

3.4 LETTERS, NUMERALS, ARROWS, SYMBOLS, AND BORDERS

Letters, numerals, arrows, symbols, and borders shall be applied on the retroreflective sheeting or opaque background of the sign using the direct or reverse screen process. Messages and borders of a color darker than the background shall be applied to the paint or the retroreflective sheeting using the direct process. Messages and borders shall be of a color lighter than the sign background and shall be applied using the reverse screen process. Opaque or transparent colors, inks, and paints of the type and quality recommended by the retroreflective sheeting manufacturer shall be used in the screen process. The screening shall be performed in a manner that results in a uniform color and tone, with sharply defined edges of

legends and borders and without blemishes on the sign background that will affect intended use. The signs shall be air dried or baked after screening according to the manufacturer's recommendations to provide a smooth hard finish. Any signs with blister's or other blemishes shall be rejected.

3.5 LOCATION AND POSITION OF SIGNS

All signs shall be located and erected in accordance with the drawings and ANSI D6.1e. Unless otherwise shown, signs shall be erected with the sign faces and posts vertical. To reduce specular glare (mirror reflection), sign panels shall be turned 3 degrees away from the road in the direction of travel. The Contracting Officer's Representative shall inspect all signs for specular reflection at night after installation has been completed. If specular reflection is apparent on any sign, it shall be adjusted by the Contractor at his expense to eliminate or minimize specular reflection to the satisfaction of the Contracting Officer's Representative.

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SECTION 02560

(COLORADO) PAVEMENTS FOR SMALL PROJECTS
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

STATE DEPARTMENT OF HIGHWAYS, DIVISION OF HIGHWAYS, STATE OF
COLORADO (CDOT)

CDOT Standard Specifications for Road and
Bridge Construction, 1999 Edition

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO T 180 (1993) Moisture-Density Relations of Soils
Using a 4.54-kg (10-lb) Rammer and an 457
mm (18-in) Drop

AASHTO TP53 (1995) Determining Asphalt Content of Hot
Mix Asphalt by the Ignition Method

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 185 (1994) Steel Welded Wire Fabric, Plain,
for Concrete Reinforcement

ASTM C 31/C 31M (1996) Making and Curing Concrete Test
Specimens in the Field

ASTM C 39 (1996) Compressive Strength of Cylindrical
Concrete Specimens

ASTM C 88 (1998) Soundness of Aggregates by Use of
Sodium Sulfate or Magnesium Sulfate

ASTM C 136 (1996a) Sieve Analysis of Fine and Coarse
Aggregates

ASTM C 143 (1990a) Slump of Hydraulic Cement Concrete

ASTM C 150 (1998) Portland Cement

ASTM C 192/C 192M (1995) Making and Curing Concrete Test
Specimens in the Laboratory

ASTM C 231 (1997) Air Content of Freshly Mixed
Concrete by the Pressure Method

ASTM C 566	(1997) Total Evaporable Moisture Content of Aggregate by Drying
ASTM C 881	(1990) Epoxy-Resin-Base Bonding Systems for Concrete
ASTM D 946	(1982; R 1993) Penetration-Graded Asphalt Cement for Use in Pavement Construction
ASTM D 1461	(1985; R 1994) Moisture or Volatile Distillates in Bituminous Paving Mixtures
ASTM D 1557	(1991; R 1998) Laboratory Compaction Characteristics of Soils Using Modified Effort (56,000 ft-lbf/ft (2,700 kN-m/m))
ASTM D 2041	(1995) Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D 2172	(1995) Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
ASTM D 2726	(1996a) Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixture
ASTM D 2950	(1991; R 1997) Density of Bituminous Concrete in Place by Nuclear Method
ASTM D 3405	(1996) Joint Sealants, Hot-Applied, for Concrete and Asphalt Pavements
ASTM D 3666	(1996a) Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials
ASTM D 4125	(1994) Asphalt Content of Bituminous Mixtures by the Nuclear Method
ASTM D 4867/D 4867M	(1996) Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D 5444	(1994) Mechanical Size Analysis of Extracted Aggregate
ASTM D 5893	(1996) Cold Applied, Single Component Chemically Curing Silicon Joint Sealant for Portland Cement Concrete Pavement
ASTM D 6307	(1998) Asphalt Content of Hot Mix Asphalt by Ignition Method

CORPS OF ENGINEERS (COE) HAND BOOK FOR CONCRETE AND CEMENT

CRD-C 525	(1989) Corps of Engineers Test Method for Evaluation of Hot-Applied Joint Sealants for Bubbling Due to Heating
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ASPHALT INSTITUTE (AI)

AI MS-2 (1994) Mix Design Methods for Asphalt
Concrete and Other Hot-Mix Types

1.2 MEASUREMENT AND PAYMENT

Section "MEASUREMENTS AND PAYMENT" of the CDOT shall not apply.

1.3 MODIFICATION TO THE CDOT

Reference to "Engineer" and "Department" in the CDOT shall mean the Contracting Officer or Representative.

1.4 DEFINITIONS

For the purposes of this specification, the following definitions apply.

1.4.1 Degree of Compaction

Degree of compaction of [aggregate base course,] [rigid pavement base course,] [subbase course,] [and aggregate surface course] shall be expressed as a percentage of the maximum density obtained by the test procedure presented in either ASTM D 1557 or AASHTO T 180, Method D. The maximum density shall be determined in accordance with ASTM D 1557 if the material gradation contains less than 30 percent retained on the 3/4 inch sieve or AASHTO T 180 if the material gradation contains more than 30 percent retained on the 3/4 inch sieve. In this specification, degree of compaction shall be a percentage of laboratory maximum density.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Plant, Equipment, and Tools

Job Mix Formula; G-RE.

Proposed JMF.

Mixture Proportions; G-RE.

The report of the Contractor's mixture proportioning studies showing the proportions of all ingredients and supporting information on aggregate and other materials that will be used in the manufacture of concrete, at least 14 days prior to commencing concrete placing operations.

SD-06 Test Reports

Initial Tests; G-RE.

Certified copies of test results for approval not less than 20 days before material is required for the work.

Contractor Quality Control; G-RE.

The Contractor shall submit all QC test results to the Contracting Officer on a daily basis as the tests are performed.

Acceptability of Work; G-RE.

The Contractor shall submit all test results to the Contracting Officer on a daily basis as the tests are performed.

SD-07 Certificates

Asphalt Cement Binder; G-RE.

Copies of certified test data.

Bituminous Tack and Prime Coat; G-RE.

Copies of certified test data.

SD-08 Manufacturer's Instructions

Manufacturer's Recommendations; G-RE

Where installation procedures, or any part thereof, are required to be in accordance with the manufacturer's recommendations, printed copies of these recommendations, 20 days prior to use on the project. Installation of the material will not be allowed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

1.6 SAMPLING AND TESTING

Sampling and testing shall be the responsibility of the Contractor. Sampling and testing shall be performed by a testing laboratory approved in accordance with Section 01451 CONTRACTOR QUALITY CONTROL. Work requiring testing will not be permitted until the testing laboratory has been inspected and approved. The materials shall be tested to establish compliance with the specified requirements; testing shall be performed at the specified frequency. The Contracting Officer may specify the time and location of the tests.

1.7 APPROVAL OF MATERIAL

The source of the material for aggregate base course, subbase course, rigid pavement base course, and aggregate surface course shall be selected 30 days prior to the time the material will be required in the work. Tentative approval of material will be based on initial test results. Final approval of the materials will be based on sieve analysis, liquid limit, and plasticity index tests performed on samples taken from the completed and fully compacted base and subbase course.

1.8 WEATHER LIMITATIONS

1.8.1 Hot-Mix Asphalt Pavement

The hot-mix asphalt pavement shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 1. The temperature requirements may be waived by the Contracting

Officer, if requested; however, all other requirements, including compaction, shall be met.

Table 1. Surface Temperature Limitations of Underlying Course

Mat Thickness, inches	Degrees F
3 or greater	40
Less than 3	45

1.8.2 Bituminous Prime and Tack Coat

Bituminous coat shall be applied only when the surface to receive the bituminous coat is dry. Bituminous coat shall be applied only when the atmospheric temperature in the shade is 50 degrees F or above and when the temperature has not been below 35 degrees F for the 12 hours prior to application.

1.8.3 Portland Cement Concrete Pavement

Limitations on the placing of concrete shall conform to Section 412.09, "Limitations of Placing Concrete" of the CDOT.

1.8.4 Base Course, Subbase Course, Aggregate Surface Course

Construction of aggregate base course, subbase course, rigid pavement base course, and aggregate surface course shall be done when the atmospheric temperature is above 35 degrees F. When the temperature falls below 35 degrees F, the Contractor shall protect all completed areas by approved methods against detrimental effects of freezing. Completed areas damaged by freezing, rainfall, or other weather conditions shall be corrected to meet specified requirements.

1.9 PLANT, EQUIPMENT, AND TOOLS

All plant, equipment, and tools used in the performance of the work shall be subject to approval before the work is started and shall be maintained in satisfactory working condition at all times. The equipment shall be adequate and shall have the capability of producing pavements meeting the requirements as set forth herein.

PART 2 PRODUCTS

2.1 HOT-MIX ASPHALT PAVEMENT

Bituminous wearing course shall conform to the requirements specified in the CDOT, Section 401, "PLANT MIX PAVEMENTS- GENERAL, and Section 403, "HOT BITUMINOUS PAVEMENT", except as modified herein. The aggregate shall be Grading [S] [SX]. Coarse aggregate shall meet the following additional requirements: Percentage of loss shall not exceed 18 after 5 cycles when performed in accordance with ASTM C 88, using magnesium sulfate. The Contractor shall develop the mix design. The laboratory used to develop the job mix formula (JMF) shall meet the requirements of ASTM D 3666. A certification signed by the manager of the laboratory stating that it meets these requirements or clearly listing all deficiencies shall be submitted to the Contracting Officer prior to the start of construction. The asphalt mix shall be dense-graded and composed of a mixture of well-graded aggregate, mineral filler if required, and asphalt material. The hot-mix

asphalt shall be designed using Marshall method of mix design contained in AI MS-2 and the criteria shown in Table 3. If the Tensile Strength Ratio (TSR) of the composite mixture, as determined by ASTM D 4867/D 4867M is less than 75, the aggregates shall be rejected or the asphalt mixture treated with an approved anti-stripping agent. The amount of anti-stripping agent added shall be sufficient to produce a TSR of not less than 75. If an antistrip agent is required, it shall be provided by the Contractor at no additional cost. The hot-mix asphalt pavement shall not contain more than 15 percent reclaimed asphalt pavement.

2.1.1.1 JMF Requirements

The job mix formula shall be submitted in writing by the Contractor for approval at least 14 days prior to the start of the test section and shall include as a minimum:

- a. Percent passing each sieve size.
- b. Percent of asphalt cement.
- c. Percent of each aggregate and mineral filler to be used.
- d. Asphalt viscosity grade or performance grade.
- e. Number of blows of hammer per side of molded specimen.
- f. Laboratory mixing temperature.
- g. Lab compaction temperature.
- h. Temperature-viscosity relationship of the asphalt cement.
- i. Plot of the combined gradation on the 0.45 power gradation chart, stating the nominal maximum size.
- j. Graphical plots of stability, flow, air voids, voids in the mineral aggregate, and unit weight versus asphalt content as shown in AI MS-2.
- k. Specific gravity and absorption of each aggregate.
- l. Percent natural sand.
- m. Percent particles with 2 or more fractured faces (in coarse aggregate).
- n. Fine aggregate angularity.
- o. Percent flat or elongated particles (in coarse aggregate).
- p. Tensile Strength Ratio(TSR).
- q. Antistrip agent (if required) and amount.
- r. List of all modifiers and amount.
- s. Percentage and properties (asphalt content, binder properties, and aggregate properties) of reclaimed asphalt pavement (RAP) if RAP is used.

Table 2. Marshall Design Criteria

<u>Test Property</u>	<u>75 Blow Mix</u>	<u>50 Blow Mix</u>
Stability, pounds minimum	*1800	*1000
Flow, 0.01 inch	8-16	8-18
Air voids, percent	3-5	3-5
Percent Voids in mineral aggregate VMA, (minimum)		
Grading S	13.0	13.0
Grading SX	14.0	14.0
TSR, minimum percent	75	75

* This is a minimum requirement. The average during construction shall be significantly higher than this number to ensure compliance with the specifications.

** Calculate VMA in accordance with AI MS-2, based on ASTM D 2726 bulk specific gravity for the aggregate.

2.1.2 Adjustments to Field JMF

The Laboratory JMF for each mixture shall be in effect until a new formula is approved in writing by the Contracting Officer. Should a change in sources of any materials be made, a new laboratory jmf design shall be performed and a new JMF approved before the new material is used.

2.1.3 Asphalt Cement Binder

Asphalt cement shall conform to the requirements specified in Section 702, "Bituminous Materials" of the CDOT. Asphalt cement binder shall be either viscosity grade AC-10 or Performance Grade (PG) 58-28 or ASTM D 946 penetration grade 85-100. Test data indicating grade certification shall be provided by the supplier at the time of delivery of each load to the mix plant. Copies of these certifications shall be submitted to the Contracting Officer. The supplier is defined as the last source of any modification to the binder.

2.2 BITUMINOUS TACK AND PRIME COAT

Test data indicating grade certification shall be provided by the supplier. Copies of these certifications shall be submitted to the Contracting Officer.

2.2.1 Bituminous Prime Coat

Bituminous prime coat shall conform to the requirements specified in Section 407, Prime Coat, Tack Coat, and Rejuvenating Agent", and Section 702, "BITUMINOUS MATERIALS", of the CDOT. Bituminous materials shall be liquid asphalt, designation MC-30, or MC-70 at the Contractor's option, except that only MC-30 shall be used on dense graded base courses if MC-70 does not adequately penetrate the base course material. In lieu of

cut-back asphalt, the Contractor may use cationic emulsified asphalt, designation CSS-1 or CSS-1h.

2.2.2 Bituminous Tack Coat

Bituminous tack coat shall conform to the requirements specified in Section 407, "Prime Coat, Tack Coat, and Rejuvenating Agent" of the CDOT. Bituminous material shall be emulsified asphalt designation SS-1 or SS-1h, or cationic emulsified asphalt designation CSS-1 or CSS-1h.

2.3 PORTLAND CEMENT CONCRETE PAVEMENT

2.3.1 Portland Cement Concrete

Portland cement concrete shall conform to the requirements specified in Section 412, "Portland Cement Concrete Pavement", and Section 601 "Structural Concrete" of the CDOT. Proportioning [and required 28-day field compressive strength] of the mix shall conform to the requirements of Class "P" concrete[, except that the required 28-day field compressive strength shall be [5000 psi]. The coarse aggregate shall have a maximum nominal size of 1-1/2 inches. The maximum allowable slump of the concrete shall be 3 inches for pavement constructed with fixed forms. For slipformed pavement, the maximum allowable slump shall be 1-1/4 inches. The water-cement ratio shall not exceed 0.45. The air content of the concrete by volume shall be maintained by the Contractor at 6.0 percent plus or minus 1.0 percent. The Contractor shall submit design mixture proportions, laboratory trial mix, aggregate data, and 28-day compressive strength test results in accordance with Section 601.05, "Proportioning" of the CDOT.

2.3.2 Welded Steel Wire Fabric

Welded steel wire fabric shall conform to ASTM A 185.

2.3.3 Dowels Bars and Tie Bars

Dowel bars and tie bars shall conform to Section 709.03 "Dowel Bars and Tie Bars" of the CDOT.

2.3.4 Epoxy Resin

Epoxy resin materials for embedding dowels shall be two-component materials conforming to the requirements of ASTM C 881, Type IV, Grade 3. Class shall be appropriate for each application temperature to be encountered.

2.4 CONCRETE SIDEWALK AND CURB AND GUTTER

2.4.1 General

Portland cement concrete shall conform to Section 601, "STRUCTURAL CONCRETE", of the CDOT, except as modified herein. Concrete shall be Class B or D. Coarse aggregate shall meet Number 57 or 67 gradation. The portland cement shall be Type I or II, and meet the optional chemical requirements for low alkali when tested in accordance with ASTM C 150.

2.4.2 Sidewalks

Portland cement concrete sidewalk shall conform to the requirements as specified in Section 608, "SIDEWALKS AND BIKEWAYS" of the CDOT.

2.4.3 Curb and Gutter

Portland cement concrete curb and gutter shall conform to the requirements as specified in Section 609, "CURB AND GUTTER", of the CDOT.

2.5 CURING MATERIALS

Curing materials for portland cement concrete pavement and sidewalk shall conform to Section 711.01 "Curing Materials" of the CDOT. Liquid membrane-forming compound shall be white pigmented type 2.

2.6 JOINT FILLER, BACKER ROD AND SEALANT

Preformed expansion joint filler and backer rod shall conform to Section 705.01, "Joint Fillers" of the CDOT. Cold-applied silicone joint sealant shall conform to ASTM D 5893. Cold-applied silicone sealant for sidewalks shall be gray or stone in color. Hot-applied joint sealant shall conform to ASTM D 3405 and CRD-C 525.

2.7 AGGREGATE BASE COURSE (ABC)

Aggregate base course aggregate shall conform to the requirements specified in Section 304, "AGGREGATE BASE COURSE" and Section 703.03 "AGGREGATE FOR BASES", of the CDOT, except as modified herein. Aggregate base course shall be CDOT Class 4 except as otherwise specified herein. The portion retained on the No. 4 sieve shall be known as coarse aggregate; that portion passing the No. 4 sieve shall be known as fine aggregate. Aggregates shall be angular particles of uniform density. Coarse aggregate shall be crushed gravel, crushed stone, crushed recycled concrete, or crushed slag. Fine aggregate shall consist of screenings, angular sand, crushed recycled concrete fines, or other finely divided mineral matter processed or naturally combined with the coarse aggregate. The amount of flat and elongated particles shall not exceed 30 percent. A flat particle is one having a ratio of width to thickness greater than 3; an elongated particle is one having a ratio of length to width greater than 3. In the portion retained on each sieve specified, the crushed aggregates shall contain at least 50 percent by weight of crushed pieces having two or more freshly fractured faces with the area of each face being at least equal to 75 percent of the smallest midsectional area of the piece. When two fractures are contiguous, the angle between planes of the fractures must be at least 30 degrees in order to count as two fractured faces. Crushed gravel shall be manufactured from gravel particles 50 percent of which, by weight, are retained on the maximum size sieve. The percentage of loss shall not exceed 18 after 5 cycles when performed in accordance with ASTM C 88, using magnesium sulfate. The portion of the material passing the No. 40 sieve shall have liquid limit not greater than 25 and a plasticity index not greater than 5. When tested for gradation, the percentage passing the No. 200 sieve shall not exceed 10 percent and the 0.02 mm sieve shall not exceed 3.0 percent.

2.8 RIGID PAVEMENT BASE COURSE

Rigid pavement base course aggregate shall conform to the requirements specified in Section 304, "AGGREGATE BASE COURSE" and Section 703.03 "AGGREGATE FOR BASES", of the CDOT, except as modified herein. Rigid pavement base course shall be CDOT Class 5 except as otherwise specified herein. The aggregate shall meet the following additional properties; the aggregate shall be a crushed quarry rock, [crushed gravel, crushed

screenings, sand or a combination thereof]. The percentage of loss shall not exceed 18 after 5 cycles when performed in accordance with ASTM C 88, using magnesium sulfate. The portion of the material passing the No. 40 sieve shall have liquid limit not greater than 25 and a plasticity index not greater than 5. When tested for gradation, the percentage passing the No. 200 sieve shall be between 9 percent and 15 percent. The 0.02 mm sieve shall not exceed 6.0 percent.

2.9 SUBBASE COURSE

Subbase course aggregate shall conform to the requirements specified in Section 304, "AGGREGATE BASE COURSE" and Section 703.03 "AGGREGATE FOR BASES", of the CDOT, except as modified herein. Subbase courses shall be CDOT Class 5 except as otherwise specified herein. The aggregate shall meet the following additional properties; the aggregate shall be a crushed quarry rock, [crushed gravel, crushed screenings, sand or a combination thereof]. The subbase course shall have a minimum California Bearing Ratio (CBR) of 50. The CBR shall be determined in accordance with AASHTO T 193. The percentage of loss shall not exceed 18 after 5 cycles when performed in accordance with ASTM C 88, using magnesium sulfate. The portion of the material passing the No. 40 sieve shall have liquid limit not greater than 25 and a plasticity index not greater than 5. When tested for gradation, the percentage passing the No. 200 sieve shall be between 9 percent and 15 percent. The 0.02 mm sieve shall not exceed 6.0 percent.

2.10 AGGREGATE SURFACE COURSE

Crushed aggregate surface course aggregate shall conform to the requirements specified in Section 304, "AGGREGATE BASE COURSE" and Section 703.03 "AGGREGATE FOR BASES", of the CDOT, except as modified herein. Aggregates shall consist of crushed stone or slag, crushed or natural gravel, sand, or other sound, durable materials processed and blended or naturally combined. Aggregates shall be durable and sound, free from lumps and balls of clay, organic matter, objectionable coatings, and other foreign material. The aggregate shall meet the gradation requirement for Class 7. The amount of flat and elongated particles shall not exceed 20 percent. A flat particle is one having a ratio of width to thickness greater than 3; an elongated particle is one having a ratio of length to width greater than 3. The aggregate for the surface course shall contain a minimum 80 percent crushed material. The portion of the material passing the No. 40 sieve shall have a liquid limit not greater than 35 and a plasticity index of 4 to 9.

2.11 INITIAL TESTS

One of each of the following tests shall be performed on the proposed aggregate base course, rigid pavement base course, subbase course and aggregate surface course material prior to commencing construction to demonstrate that the proposed material meets all specified requirements when furnished. If materials from more than one source are going to be utilized, this testing shall be completed for each source.

- a. Sieve Analysis including 0.02 mm size material.
- b. Liquid limit and plasticity index moisture-density relationship.
- c. Moisture-density relationship.
- d. Wear.

e. Soundness.

PART 3 EXECUTION

3.1 PAVEMENT REMOVAL

Where p.c. concrete and bituminous pavement is to be removed [at the locations shown on the drawings], the pavement shall be sawed with a pre-approved concrete saw so as to leave a straight true edge. P.C. concrete pavement removal shall be accomplished by a full depth double sawcut. The initial sawcut shall be located in the pavement area to be removed and shall be 18 inches from the final sawcut. The pavement material [and existing base course] shall be removed in a manner that will not damage the adjacent in-place pavement to remain [and as shown on the drawings]. The Contractor must demonstrate that his method of removal will not damage adjacent concrete pavement slabs. Any slab found by the Contracting Officer to be damaged by the Contractor's removal methods shall be fully removed and replaced at no cost to the Government. Pavement material from the removal area shall be disposed of [outside the limits of Government controlled land at the Contractor's expense] [at the disposal area indicated on the drawings].

3.2 HOT-MIX ASPHALT PAVEMENT

Hot-mix asphalt pavement wearing course shall be constructed to the requirements specified in the CDOT, Section 401, "PLANT MIX PAVEMENTS-GENERAL" and Section 403, "HOT BITUMINOUS PAVEMENT", except as modified herein.

3.2.1 Contractor Quality Control

A standard lot for all requirements will be equal to 8 hours of production.

3.2.1.1 Asphalt Content

A minimum of two tests to determine asphalt content will be performed per lot by one of the following methods: the extraction method in accordance with ASTM D 2172, Method A or B, the ignition method in accordance with the AASHTO TP53 or ASTM D 6307, or the nuclear method in accordance with ASTM D 4125, provided the nuclear gauge is calibrated for the specific mix being used. For the extraction method, the weight of ash, as described in ASTM D 2172, shall be determined as part of the first extraction test performed at the beginning of plant production; and as part of every tenth extraction test performed thereafter, for the duration of plant production. The last weight of ash value obtained shall be used in the calculation of the asphalt content for the mixture.

3.2.1.2 Gradation

Aggregate gradations shall be determined a minimum of twice per lot from mechanical analysis of recovered aggregate in accordance with ASTM D 5444. When asphalt content is determined by the nuclear method, aggregate gradation shall be determined from hot bin samples on batch plants, or from the cold feed on drum mix plants. For batch plants, aggregates shall be tested in accordance with ASTM C 136 using actual batch weights to determine the combined aggregate gradation of the mixture.

3.2.1.3 Temperatures

Temperatures shall be checked at least four times per lot, at necessary locations, to determine the temperature at the dryer, the asphalt cement in the storage tank, the asphalt mixture at the plant, and the asphalt mixture at the job site.

3.2.1.4 Aggregate Moisture

The moisture content of aggregate used for production shall be determined a minimum of once per lot in accordance with ASTM C 566.

3.2.1.5 Moisture Content of Mixture

The moisture content of the mixture shall be determined at least once per lot in accordance with ASTM D 1461 or an approved alternate procedure.

3.2.1.6 Laboratory Air Voids, Marshall Stability and Flow

Mixture samples shall be taken at least four times per lot and compacted into specimens, using [50] [75] blows per side with the Marshall hammer. After compaction, the laboratory air voids of each specimen shall be determined, as well as the Marshall stability and flow.

3.2.2 Acceptability of Work

The pavement will be accepted on the basis of tests made by the the Contractor or its suppliers, as specified herein. The Government may, at its discretion, make check tests to validate the results of the Contractor's testing.

3.2.2.1 Sampling Pavements

Samples of the finished pavement, shall be obtained by the Contractor. The location of the samples shall be as directed and the cores shall be at least 4 inches in diameter. The samples shall be tested by the Contractor to determine conformance to density. Specimens shall be tested in accordance with the requirements of ASTM D 2726. Three samples shall be taken and tested for each 750 tons or less of bituminous mixture placed each day. A minimum of one core shall be obtained from the longitudinal joint. The Contractor shall fill all cores holes with new material and shall meet the requirements as described herein.

3.2.2.2 Laboratory Air Voids

Laboratory air voids will be calculated by determining the Marshall density of each laboratory compacted specimen using ASTM D 2726 and determining the theoretical maximum density of every other subplot sample using ASTM D 2041.

Laboratory air void calculations for each subplot will use the latest theoretical maximum density values obtained, either for that subplot or the previous subplot. The mean absolute deviation of the four laboratory air void contents (one from each subplot) from the JMF air void content will be evaluated. The mean absolute deviation shall be less than 1.00. All laboratory air void tests will be completed and reported within 24 hours after completion of construction of each lot.

3.2.2.3 In-place Density

Density of the compacted mixture of the bituminous wearing course shall be between 97 and 100 percent (joint density 95 to 100 percent) of the maximum

laboratory compacted density. The maximum laboratory compacted specimens shall be determined from the same mixture taken from the plant in accordance with ASTM D 2041. Densities of the in-place compacted mixture may be determined by the nuclear method in accordance with ASTM D 2950 for Contractor quality control purposes. In any event, the basis of acceptance for density shall be determined from the specific gravity method.

3.2.2.4 Surface Smoothness

After the final rolling, but not later than 24 hours after placement, the surface of the pavement in each entire lot shall be tested by the Contractor in such a manner as to reveal all surface irregularities exceeding the tolerances specified below. If any pavement areas are ground, these areas shall be retested immediately after grinding. All testing shall be performed in the presence of the Contracting Officer. Detailed notes of the results of the testing shall be kept and a copy furnished to the Government immediately after each day's testing. The entire area of the pavement shall be tested in both a longitudinal and a transverse direction on parallel lines. The transverse lines shall be 25 feet or less apart, as directed. The longitudinal lines shall be at the centerline of each paving lane for lines less than 20 feet and at the third points for lanes 20 feet or greater. Other areas having obvious deviations shall also be tested. Longitudinal testing lines shall be continuous across all joints. Where drawings show required deviations from a plane surface (crowns, drainage inlets, etc.), the surface shall be finished to meet the approval of the Contracting Officer. The straightedge shall be held in contact with the surface and moved ahead one-half the length of the straightedge for each successive measurement. The amount of surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between these two high points. The finished surfaces of the pavements shall have no abrupt change of 3/16 inch or more, and all pavements shall be within the tolerances specified in Table 3 when checked with an approved 10 foot straightedge.

Table 3. Straightedge Surface Smoothness--Pavements		
Pavement Category	Direction of Testing	Tolerance, inches
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All	Longitudinal	3/16
paved areas	Transverse	3/16

3.3 BITUMINOUS TACK AND PRIME COAT

Except as otherwise specified herein, application of bituminous tack and prime coat shall be in accordance with Section 407, PRIME COAT, TACK COAT, AND REJUVENATING AGENT" of the CDOT. Following application of the bituminous material and prior to the application of the pavement, the bituminous coat shall be allowed to cure and to obtain evaporation of any volatiles or moisture.

3.3.1 Bituminous Tack Coat

Contact surfaces of previously constructed pavement, curbs, manholes, and other structures shall be sprayed with a thin coat of bituminous tack coat. Rate of application shall be not less than 0.05 gallon nor more than 0.15

gallon per square yard.

3.3.2 Bituminous Prime Coat

A prime coat will be required if it will be at least seven days before a the surfacing (Asphalt cement hot mix concrete) layer is constructed on the underlying (base course, etc) compacted material. The type of liquid asphalt and application rate will be as specified herein. The Contractor shall protect the underlying from any damage (water, traffic, etc.) until the surfacing is placed. If the Contractor places the surfacing within seven days, the choice of protection measures or actions to be taken is at the Contractor's option. Damage to the underlying material caused by lack of, or inadequate, protection shall be repaired (recompacted or replaced) by approved methods at no additional cost to the Government. If the Contractor options to use the prime coat, it shall be applied as soon as possible after consolidation of the underlying material. Rate of application shall be not less than 0.15 gallon nor more than 0.40 gallon per square yard. To obtain uniform application of the prime coat on the surface treated at the junction of previous and subsequent applications, building paper shall be spread on the surface for a sufficient distance back from the ends of each application to start and stop the prime coat on the paper. Immediately after application, the building paper shall be removed and destroyed. Prime coat shall be allowed to cure without being disturbed for a period of at least 48 hours or longer, as may be necessary to attain penetration into the treated course.

3.4 PORTLAND CEMENT CONCRETE PAVEMENT

Except as otherwise specified herein, portland cement concrete shall be constructed in accordance with the requirements specified in Section 412, "PORTLAND CEMENT CONCRETE PAVEMENT", and Section 601, "STRUCTURAL CONCRETE" of the CDOT. Tining and stationing of concrete is not required.

3.4.1 Spreading

Spreading shall be by machine or hand method. Hand spreading will be permitted only when approved for odd widths or shapes of slabs, or for placement of separate, isolated slabs during removal and replacement type repair operations, or for lanes 50 feet or less in length. Hand spreading, where permitted, shall be done with shovels; rakes shall not be used. Where the concrete is delivered to the form in truck mixers, suitable chutes may be used, provided windrows cover essentially the entire area within the form. In no case shall dumping of concrete in piles be permitted.

3.4.2 Placing Reinforcing Steel

Reinforcement shall be positioned on suitable chairs securely fastened to the subgrade prior to concrete placement, or may be placed on an initial layer of consolidated concrete, with the subsequent layer placed within 30 minutes of the first layer placement.

3.4.3 Joints

Transverse and longitudinal contraction joints shall be of the weakened plane type and shall be formed by sawing. Joints shall be sealed with hot-applied or cold-applied sealant immediately following curing of the concrete or as soon thereafter as weather conditions permit. Before sealing operations commence, a copy of the Manufacturer's Recommendations

pertaining to the storage, heating and application of the sealant shall be submitted to the Contracting Officer.

3.4.4 Contractor Quality Control

The Contractor shall perform the inspection and tests described below at the placement and, based upon the results of these inspections and tests, shall take the action required and submit reports as specified. When, in the opinion of the Contracting Officer, the paving operation is out of control, concrete placement shall cease. The Contractor shall furnish all materials, labor, and facilities required for molding, curing, testing, and protecting test specimens at the site and in the laboratory.

3.4.4.1 Air Content Testing

Air content tests shall be made when test specimens are fabricated. In addition, at least two other tests for air content shall be made on randomly selected batches of each separate concrete mixture produced during each 8-hour period of paving. All air content measurements shall be determined in accordance with ASTM C 231. Whenever air content reaches specified limits, an immediate confirmatory test shall be made. If the second test also shows air content at or exceeding specified limits, an adjustment shall immediately be made in the amount of air-entraining admixture batched to bring air content within specified limits. If the next adjusted batch of concrete is not within specified limits, concrete placement shall be halted until concrete air content is within specified limits.

3.4.4.2 Slump Testing

Slump tests shall be made when test specimens are fabricated. Additional tests shall be made when excessive variation in workability is reported by the placing foreman or Government inspector. All slump tests shall be made in accordance with ASTM C 143. Whenever slump approaches the maximum limit, an adjustment shall immediately be made in the batch masses of water and fine aggregate. When a slump result exceeds the specification limit, no further concrete shall be delivered to the paving site until adjustments have been made and slump is again within the limit.

3.4.4.3 Temperature

The temperature of the concrete shall be measured when strength specimens are fabricated.

3.4.4.4 Concrete Strength Testing

Four (4) cylinders from the same batch shall be fabricated, cured and tested for compressive strength, testing two cylinders at 7-day and two cylinders at 28-day age. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days. A minimum of one set of four (4) cylinders shall be fabricated, cured and tested for each shift of concrete placement nor less than once for each 250 cubic yards of concrete or fraction thereof. All test cylinders shall be 6 by 12 inch cylinders and shall be fabricated in accordance with ASTM C 192/C 192M, using only steel molds, cured in accordance with ASTM C 31/C 31M, and tested in accordance with ASTM C 39. Control charts for strength, showing the 7-day and 28-day CQC compressive strengths, and the 28-day required compressive strength, shall be maintained and submitted with weekly CQC Reports.

3.4.5 Acceptability of Work

The pavement will be accepted on the basis of tests made by the Contractor or its suppliers, as specified herein. The Government may, at its discretion, make check tests to validate the results of the Contractor's testing.

3.4.5.1 Strength Requirements

A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days. The strength of the concrete will be considered satisfactory so long as the running average of all sets of three consecutive test results equals or exceeds the specified 28-day field compressive strength and no individual test result falls below the specified strength by more than 500 psi. The Contractor shall furnish all materials, labor, and facilities required for molding, curing, testing, and protecting test specimens at the site and in the laboratory.

3.4.5.2 Surface Smoothness Requirements

The surface of the pavement shall be tested with a 3 m (10 foot) straightedge to identify all surface irregularities exceeding the tolerances specified above. The entire area of the pavement shall be tested in both a longitudinal and a transverse direction on parallel lines approximately 15 feet apart. The straightedge shall be held in contact with the surface and moved ahead one-half the length of the straightedge for each successive measurement. The amount of surface irregularity shall be determined by placing the straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length and measuring the maximum gap between the straightedge and the pavement surface, in the area between these two high points. The finished surfaces of the pavements shall have no abrupt change of 1/8 inch or more. All pavements shall have a surface smoothness tolerance within 1/4 inch in the transverse and longitudinal direction, except that roads and streets shall have tolerance of 3/16 inch in the longitudinal direction. In areas not meeting the specified limits for surface smoothness, high areas shall be reduced to attain the required smoothness, except as depth is limited below. High areas shall be reduced by grinding the hardened concrete with a surface grinding machine after the concrete is 14 days or more old. The depth of grinding shall not exceed 1/4 inch. All pavement areas requiring surface smoothness corrections in excess of the specified limits, shall be removed and replaced. All areas in which grinding has been performed will be subject to the thickness tolerances specified in paragraph Thickness. Any grinding performed on individual slabs with excessive deficiencies shall be performed at the Contractor's own decision without entitlement to additional compensation if eventual removal of the slab is required.

3.4.5.3 Edge Slump Testing and Conformance

When slip-form paving is used, not more than 15 percent of the total free edge [of any 10 inch or thicker slab] of the slipformed portion of the pavement, shall have an edge slump exceeding 1/4 inch and no slab shall have an edge slump exceeding 3/8 inch. Edge slump shall be determined as above for surface smoothness, at each free edge of each slipformed paving lane constructed. Measurements shall be made at 5 to 15 foot spacings, and as directed. When edge slump exceeding the limits specified above is encountered on either side of the paving lane, additional straightedge

measurements shall be made, if required, to define the linear limits of the excessive slump. The concrete for the entire width of the paving lane within these limits of excessive edge slump shall be removed and replaced. Adding concrete or paste to the edge or otherwise manipulating the plastic concrete after the sliding form has passed, or patching the hardened concrete, shall not be used as a method for correcting excessive edge slump.

3.4.5.4 Thickness Determination

The thickness of the pavement shall be determined by the Government on the basis of measurements made on 4 inch diameter cores which shall be drilled by the Contractor, within 7 days after placement of the concrete. Cores shall be drilled at the points directed by the Contracting Officer and there shall be at least one core taken from each separate pavement areas of 4000 sq yd or less. The Contractor shall fill the core holes with an approved non-shrink high strength grout. [For pavements less than 8 inches in thickness, when any core shows a deficiency in thickness greater than 1/4 inch, the pavement area represented by the core shall be removed and replaced by the Contractor at no cost to the Government.] [For pavements greater than 8 inches in thickness, when any core shows a deficiency in thickness greater than 1/2 inch, the pavement area represented by the core shall be removed and replaced by the Contractor at no cost to the Government.]

3.5 CONCRETE SIDEWALK AND CURB AND GUTTER

The subgrade shall be in a moist condition when concrete is placed. The subgrade shall be prepared and protected to produce a subgrade free from frost when the concrete is deposited. Forms shall be cleaned and coated with form oil each time before concrete is placed. Wood forms may, instead, be thoroughly wetted with water before concrete is placed, except that with probable freezing temperatures, oiling is mandatory.

3.5.1 Sidewalks

Except as otherwise specified herein, portland cement concrete sidewalk shall be constructed in accordance with Section 608, "SIDEWALKS AND BIKEWAYS" of the CDOT. Subgrade shall be placed and compacted in conformance with [Section 02300 EARTHWORK] [Section 02210 GRADING]. The subgrade shall be tested for grade and cross section by means of a template extending the full width of the sidewalk and supported between side forms. Finished surfaces shall not vary more than 5/16 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch. All slab edges, including those at formed joints, shall be finished with an edger having a radius of 1/8 inch. Transverse joint shall be edged before brooming, and the brooming shall eliminate the flat surface left by the surface face of the edger. Sidewalk joints shall be constructed to divide the surface into square or rectangular areas. Spacing of transverse and longitudinal contraction and expansion joints shall be as indicated. At the end of the curing period, expansion joints shall be carefully cleaned and filled with cold-applied joint sealant (gray or stone color) as indicated on the drawings. The joint opening shall be thoroughly cleaned before the sealing material is placed. Sealing material shall not be spilled on exposed surfaces of the concrete. Concrete at the joint shall be surface dry and the atmospheric and concrete temperatures shall be above 50 degrees F at the time of application of joint sealing material.

3.5.2 Curb and Gutter

Except as otherwise specified herein, portland cement concrete curb and gutter shall be constructed in accordance with Section 609, "CURB AND GUTTER", of the CDOT. The subgrade shall be tested for grade and cross section by means of a template extending the full width of the curb and gutter. Concrete shall be placed to the section required in a single lift.

Consolidation shall be achieved by using approved mechanical vibrators. Curve shaped gutters shall be finished with a standard curb "mule". Approved slipformed curb and gutter machines may be used in lieu of hand placement. Exposed surfaces shall be floated and finished with a smooth wood float until true to grade and section and uniform in texture. The edges of the gutter and top of the curb shall be rounded with an edging tool to a radius as shown on the drawings. Finished surfaces shall not vary more than 1/4 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch. Contraction joints shall be spaced so that monolithic sections between curb returns will not be less than 5 feet nor greater than 15 feet in length. Contraction joints shall be constructed by means of 1/8 inch thick separators and of a section conforming to the cross section of the curb and gutter. Separators shall be removed as soon as practicable after concrete has set sufficiently to preserve the width and shape of the joint and prior to finishing. Expansion joints shall be formed by means of preformed expansion joint filler material cut and shaped to the cross section of curb and gutter. Expansion joints at least 1/2 inch in width shall be provided at intervals not exceeding 40 feet. Expansion joints and the top 1 inch depth of contraction joints shall be sealed with cold or hot-applied sealant immediately following curing of the concrete or as soon thereafter as weather permits. The joint opening shall be thoroughly cleaned before the sealing material is placed. Sealing material shall not be spilled on exposed surfaces of the concrete. Concrete at the joint shall be surface dry and the atmospheric and concrete temperatures shall be above 50 degrees F at the time of application of joint sealing material. Excess material on exposed surfaces of the concrete shall be removed immediately and concrete surfaces cleaned.

3.5.3 Curing and Protection

Concrete shall be protected against loss of moisture and rapid temperature changes for at least 7 days from the beginning of the curing operation. Concrete shall be cured using one of the following methods

3.5.3.1 Mat Method

The entire exposed surface shall be covered with 2 or more layers of burlap. Mats shall overlap each other at least 6 inches. The mat shall be thoroughly wetted with water prior to placing on concrete surface and shall be kept continuously in a saturated condition and in intimate contact with concrete for not less than 7 days.

3.5.3.2 Impervious Sheeting Method

The entire exposed surface shall be wetted with a fine spray of water and then covered with impervious sheeting material. Sheets shall be laid directly on the concrete surface with the light-colored side up and overlapped 12 inches when a continuous sheet is not used. The curing medium shall not be less than 18 inches wider than the concrete surface to be cured, and shall be securely weighted down by heavy wood planks, or a bank of moist earth placed along edges and laps in the sheets. Sheets shall be satisfactorily repaired or replaced if torn or otherwise damaged

during curing. The curing medium shall remain on the concrete surface to be cured for not less than 7 days.

3.5.3.3 Membrane Curing Method

A uniform coating of white-pigmented membrane-curing compound shall be applied to the entire exposed surface of the concrete as specified in Section 412.14, "Curing" of the CDOT.

3.6 AGGREGATE COURSES

Aggregate base course, subbase course, rigid pavement base course, and aggregate surface course shall conform to, and be constructed in accordance with, the requirements specified in Section 304, "AGGREGATE BASE COURSE" and Section 703.03, "AGGREGATE FOR BASES" of the CDOT, except as modified herein. The aggregate base course, subbase course, rigid pavement base course, and aggregate surface course shall be compacted to 100 percent of laboratory maximum density.

3.6.1 Acceptability of Work

The aggregate base course, subbase course, rigid pavement base course, and aggregate surface course will be accepted on the basis of tests made by the Contractor as specified herein. The Government may, at its discretion, make check tests to validate the results of the Contractor's testing.

3.6.1.1 In-Place Tests

One of each of the following tests shall be performed on samples taken from the placed and compacted aggregate course. Samples shall be taken and tested at the rates indicated for each layer of material placed.

a. Density tests shall be performed on every lift of material placed and at a frequency of one set of tests for every 250 square yards, or portion thereof, of completed area.

b. Sieve Analysis [including No. 635 size material] shall be performed on every lift of material placed and at a frequency of one test for every 1000 square meters, or portion thereof, of completed area for every 500 tons, or portion thereof, of material placed.

c. Liquid limit and plasticity index tests shall be performed at the same frequency as the sieve analysis.

3.6.1.2 Thickness

The total compacted thickness of the aggregate course shall be within 1/2 inch of the thickness indicated. Where the measured thickness is more than 1/2 inch deficient, such areas shall be corrected by scarifying, adding new material of proper gradation, reblading, and recompacting as directed. Where the measured thickness is more than 1/2 inch thicker than indicated, the course shall be considered as conforming to the specified thickness requirements. Average job thickness shall be the average of all thickness measurements taken for the job, but shall be within 1/4 inch of the thickness indicated. The total thickness of the aggregate course shall be measured at intervals in such a manner as to ensure one measurement for each 500 square yards of aggregate course. Measurements shall be made in 3 inch diameter test holes penetrating the aggregate course.

3.6.1.3 Smoothness

The surface of the top layer shall show no deviations in excess of 3/8 inch when tested with a 10 foot straightedge applied parallel with and at right angles to the centerline of the area to be paved. Measurements shall be taken in successive positions parallel to the centerline of the area to be paved. Measurements shall also be taken perpendicular to the centerline at 50 foot intervals. Deviations exceeding this amount shall be corrected by removing material and replacing with new material, or by reworking existing material and compacting it to meet these specifications.

-- End of Section --

ATTACHMENT NO. 5

ENGINEERING TECHNICAL LETTERS (ETL)

The following Engineering Technical Letters are attached:

ETL 94-2	UTILITY METERS IN NEW AND RENOVATED FACILITIES
ETL 94-4	ENERGY USAGE CRITERIA FOR FACILITIES IN THE MILITARY CONSTRUCTION PROGRAM
ETL 00-5	SEISMIC DESIGN FOR BUILDINGS AND OTHER STRUCTURES

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE CIVIL ENGINEERING SUPPORT AGENCY

10 JUN 1994

FROM: HQ AFCEA/ENM
139 Barnes Drive Suite 1
Tyndall AFB FL 32403-5319

SUBJECT: Engineering Technical Letter (ETL) 94-2:
Utility Meters in New and Renovated Facilities

1. Purpose. This ETL establishes a mandatory requirement for utility meters in new and renovated base facilities to measure consumption of supplied water, fuel, or energy. These meters measure energy and water used by general purpose (process) buildings, and utilities services reimbursable or refundable by the government or private business. Use of meters will:

- o Establish benchmarks of current energy consumption to help the Base
- o Energy Conservation Committee manage facility energy consumption;
- o Identify high energy and water consumers to help base personnel reduce consumption;
- o Enhance safety of fuel hydrant systems; and
- o Allow response to frequent Congressional inquiries regarding the effectiveness of energy and water analyses through metering.

2. Application.

2.1. Authority. The Code of Federal Regulations (10 CFR 435, Sect 10, Energy Management) and the Energy Policy Act of 1992 (Public Law 102-486, Sect 305), require metering of each distinct utility-provided energy service. This ETL also satisfies requirements of Office of the Secretary of Defense (OSD) Defense Energy Program Policy Memorandum (DEPPM) 92-2, Energy Conservation Investment Program Guidance, 4 March 1992, to validate energy savings.

2.2. Effective Date. This ETL supersedes ETL 87-5, Utility Meters in New and Renovated Facilities, 13 July 1987, and is effective immediately.

3. Specific Requirements. Install meters at all new facilities and each major renovation project. Install additional meters as required to satisfy local environmental monitoring laws. Provide a meter for each energy utility serving the building (steam, high-temperature hot water, electricity, natural gas, fuel oil). Meters will be calibrated in the normal units of the utility [MJ (kWh), L (cf or gal)]. If one form of energy is used to produce a second form (such as natural gas producing steam) used solely within that facility, meter only the primary source at the building boundary.

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NOTE: These meters are for government use only for monitoring and evaluating energy consumption within a facility. They are NOT for utility company billing usage!

3.1. Electric Metering. Measure energy consumed by:

- o Electrical lighting;
- o Miscellaneous power outlets;
- o HVAC systems and equipment;
- o Service hot water; and
- o Process loads

for buildings where combined service exceeds 150 kVA or fuel use exceeds 146,536 W (500,000 Btu/h). Meter the following individually where system consumption exceeds 100 kVA or 87,921 W (300,000 Btu/h):

- o Production processes (manufacturing, computers, laundries, kitchens);
- o Auxiliary systems and service water heating;
- o Space heating (including reheat);
- o Space cooling; and
- o HVAC delivery systems.

Exception: When there is an energy service for only two of the six categories listed, take a single measurement for the larger service, and determine consumption of the smaller service by subtracting the larger service measurement from the primary service measurements.

3.2. Water Metering. Measure water consumption for:

- o All non-appropriated funded facilities which reimburse the government for water usage.
- o All facilities with a boiler plant 879.21 kW (3 MBtu/h) capacity or larger.
- o Facilities that use more than 18,927 liters (5000 gallons) of water per day, including landscape irrigation. These facilities should be addressed on a case-by-case basis and specified in the project definition when this requirement applies.

3.3. Types of Meters.

3.3.1. Watt-hour Meters.

3.3.1.1. Without Demand Registers. Watt-hour meters and sockets must comply with ANSI C12.10 and have pulse initiators for remote monitoring of watt-hour consumption. The pulse initiator will consist of Form C contacts with:

- o Current rating not to exceed 2 amperes (A);
- o Voltage not to exceed 500 volts (V);

- o Volt-amperes (VA) not to exceed 1 00 VA; and
- o Life rating of one billion operations.

3.3.1.2. With Demand Registers. Meters and sockets must comply with ANSI C12.10 and have pulse initiators for remote monitoring of watt-hour consumption and instantaneous demand. Pulse initiators will be as described in paragraph 3.3.1.1.

3.3.2. Water Meters. Meters must conform to American Water Works Association (AWWA) C700 and meet these criteria:

- o positive displacement, oscillating piston, or oscillating disc type;
- o magnetic drive with magnetic shielding;
- o straight reading sealed register graduated in liters (cubic feet);
- o all bronze split case;
- o integral strainer;
- o threaded ends;
- o with pulse switch initiator.

Water meters must be capable of accurately measuring and handling water at pressure, temperatures, and-flow rates encountered. The pulse initiator will provide the maximum number of pulses, up to 500 per minute, obtainable from the manufacturer; and not less than 1 pulse per 378.5 liters (100 gallons).

3.3.3. Gas Meters. Install meters according to 49 CFR 192, Transportation of Natural or Other Gas by Pipeline: Minimum Federal Safety Standards and the Guidance Manual for Operations of Small Gas Systems, U.S. Department of Transportation. Gas meters must conform to the American Gas Association (AGA) standard appropriate for the size and type meter installed. Meters must be capable of providing pulse or digital signals for remote readout. Pulse switch initiators will provide the maximum number of pulses, up to 500 per minute, obtainable from the manufacturer; and not less than 1 pulse per 2.83 cubic meters (100 cubic feet). Meters will have local readout capability and be calibrated in standard cubic meters (cubic feet).

3.3.4. Steam Condensate Meters. Meters must conform to MIL-M-1 8294, Style A or C, size 1. Meters will be designed for 121.1 degrees Celsius (250 degrees Fahrenheit) condensate, and flow rates from 7.6 to 37.8 liters (2 to 10 gallons) per minute. Meters will have a pulse switch initiator capable of 500 pulses per minute with no false pulses; and not less than 1 pulse per 37.8 liters. Meters will not require field adjustments.

3.3.5. Chilled Water Meters. If the facility receives chilled water from a central chilled water plant, install a watt ("Btu") meter. This is a commercially available meter which senses flow and temperature differential and automatically calculates and records watts. Meters must be capable of being read locally and by the base Energy Management and Control System (EMCS).

3.3.6. High-Temperature Water (HTW) Meters. If the facility is supplied HTW from a central plant, install a watt meter. This meter is similar to the chilled water meter, but suitable for the temperature and pressures incurred with HTW. Meters must be capable of being read locally and by the base EMCS.

3.3.7. Fuel Flow Meters. Refer to AFM 85-16, Maintenance of Petroleum Systems and NAVFAC DM 22, Petroleum Fuel Facilities.

3.3.8. Water and Wastewater Treatment Plant and Well Meters. Install meters for all plants and wells. Install flow-rate recording and totalizing meters in all plants treating more than 189,271 liters per day (0.05 MGD). Install totalizing meters in smaller plants. Components will meet these criteria:

- o Parshall flume - reinforced concrete with aluminum or reinforced fiberglass liner;
- o Nozzles - cast iron;
- o Weirs - brass alloy;
- o Magnetic - standard manufacturers product;
- o Control panel - standard manufacturers product (recording, indicating, and totalizing).

For wastewater treatment plant meters, refer to NAVFACENGCOM Guide Spec NFGS-13321, Flow Measuring Equipment (Potable Water) (Sewage Treatment Plant), 2 October 1985.

3.3.9. Heating Plant Meters- Provide the following instruments, meters, and auxiliaries:

3.3.9.1. Temperature Recorders: One for each high-temperature water boiler and each district heating circuit. Include meters on supply and return systems.

3.3.9.2. Recording and Integrating Flowmeters in Kilopascals (Pounds: One for each high-temperature water boiler and each district heating circuit.

3.3.9.3. Steam-Flow Meters: One recording and integrating type meter for each boiler using 87.9 kW (0.3 MBtu/h) or larger; or on a main header for a group of small boilers totaling 146.5 kW (0.5 MBtu/h) or more that allows recording pressure. Meters must be capable of being read locally and by the base EMCS. Turbine-type steam meters are not recommended. Refer to ANSI MFC-4M-86, Measurement of Gas Flow by Turbine Meters (R1990); MFC-5M-85, Measurement of Liquid Flow in Closed Conduits Using Transit-Time Ultrasonic Flowmeters; MFC-6M-87, Measurement of Fluid Flow in Pipes Using Vortex Flowmeters; MFC-11M-89, Measurement of Fluid Flow by Means of Coriolis Mass Flowmeters; and ASME PTC 19.5-72, Application Part II of Fluid Meters, sixth edition, 1971.

3.3.9.4. KWh (MBtu/h) Feedwater Meters: One for each high pressure boiler

plant 146.5 kW or larger not equipped with steam-flow meters.

3.3.9.5. CO₂, O₂, and Boiler Exit Temperature Recorders: One CO₂ or O₂ recording meter for each boiler 2931 to 13,188 kW (10 to 45 MBtu/h) output capacity. Provide boiler exit temperature on all boilers over 2931 kW.

3.3.10. Chilled Water Plant Meters. Install a temperature recorder at each plant. Provide flow recorders for constant and variable speed pumps, one for each chiller and each district chilled water circuit. Install meters on both supply and returns.

3.3.11. Make-Up Water Meters: One for each high-pressure steam and high-temperature water boiler plant.

3.3.12. Gas and Oil Meters: One for each boiler or direct-fired hot air furnace plant 879 kW (3 MBtu/h) or larger.

3.3.13. Temperature and Pressure Recorders: One for each feed water heater.

4. Definitions. New and renovated facilities include facilities which have not reached the 10 percent design stage as of the date of this letter. For this ETL, renovated facilities feature changes in the building envelope, replacement of lighting, HVAC, or water heating systems.

5. Point of Contact. Mr Freddie L. Beason, PE, HQ AFCESA/ENM, DSN 523-6361, commercial (904) 283-6361, FAX 523-6219.

DENNIS M FIRMAN, PE
Director, Systems Engineering

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ENGINEERING TECHNICAL LETTERS (ETL)

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	Change No. 1 ETL 83-1, U. S. Air Force	
	Standardized Heating, Ventilating & Air	
	Conditioning (HVAC) Control Systems	22 Jul 87
83-3	Interior Wiring Systems, AFM 88-15 Para 7-3	2 Mar 83
83-4	EMCS Data Transmission Media (DTM) Considerations	3 Apr 83
83-7	Plumbing, AFM 88-8, Chapter 4	30 Aug 83
83-8	Use of Air-to-Air Unitary Heat Pumps	15 Sep 83
83-9	Insulation	14 Nov 83
84-2	Computer Energy Analysis	27 Mar 84
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	031600Z MAY 84	1 Jun 84
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ENGINEERING TECHNICAL LETTERS (ETL)

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89-3	Facility Fire Protection Criteria for Electronic Equipment Installations	9 Jun 89
89-4	Systems Furniture Guide Specification	6 Jul 89
89-6	Power Conditioning and Continuation Interfacing Equipment (PCCIE) in the Military Construction Program (MCP)	7 Sep 89
89-7	Design of Air Force Courtrooms	29 Sep 89
90-1	Built-Up Roof (BUR) Repair/Replacement Guide Specification	23 Jan 90
90-2	General Policy for Prewired Workstations and Systems Furniture	26 Jan 90
90-3	TEMPEST Protection for Facilities Change 1 Ref: HQ USAF/LEEDE Ltr dated 20 April 90, Same Subject	23 Mar 90
90-4	1990 Energy Prices and Discount Factors for Life-Cycle Cost Analysis	24 May 90
90-5	Fuel and Lube Oil Bulk Storage Capacity for Emergency Generators	26 Jul 90
90-6	Electrical System Grounding, Static Grounding and Lightning Protection	3 Oct 90
90-7	Air Force Interior Design Policy	12 Oct 90
90-8	Guide Specifications for Ethylene Propylene Diene Monomer (EPDM) Roofing	17 Oct 90
90-9	Fire Protection Engineering Criteria for Aircraft Maintenance, Servicing, and Storage Facilities	2 Nov 90
90-10	Commissioning of Heating, Ventilating, and Air Conditioning (HVAC) Systems Guide Specification	17 Oct 90
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91-5	Fire Protection Engineering Criteria - Emergency Lighting and Marking of Exits	18 Jun 91
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ENGINEERING TECHNICAL LETTERS (ETL)

SECTION A - CURRENT ETLs

ETL Number	Title	Date Issued
91-7	Chlorofluorocarbon (CFC) Limitation in Heating, Ventilating and Air-Conditioning (HVAC) Systems	21 Aug 91
93-1	Construction Signs	11 Mar 93
93-2	Dormitory Criteria for Humid Areas	13 Jul 93
93-3	Inventory, Screening, Prioritization, and Evaluation of Existing Buildings for Seismic Risk	18 Aug 93
93-4	Fire Protection Engineering Criteria - Automatic Sprinkler Systems in Military Family Housing (MFH)	11 Aug 93
93-5	Fire Protection Engineering Criteria - Electronic Equipment Installations	22 Dec 93
94-1	Standard Airfield Pavement Marking Schemes	5 Apr 94
94-2	Utility Meters in New and Renovated Facilities	10 Jun 94

SECTION B - OBSOLETE ETLs

No.	Date	Status
82-1	10 Nov 82	Superseded by ETL 83-10, 86-1, 87-4
82-3	10 Nov 82	Superseded by ETL 83-5, 84-2
82-4	10 Nov 82	Superseded by ETL 84-7
82-5	10 Nov 82	Superseded by ETL 84-1, 86-13, 86-14
82-6	30 Dec 82	Cancel l ed
82-7	30 Nov 82	Cancel l ed
83-2	16 Feb 83	Superseded by ETL 84-3
83-5	5 May 83	Superseded by ETL 84-2
83-6	24 May 83	Cancel l ed
83-10	28 Nov 83	Superseded by ETL 86-1
84-1	18 Jan 84	Superseded by ETL 86-14
84-3	21 Mar 84	Cancel l ed
84-4	10 Apr 84	Superseded by ETL 86-7, 86-15, 87-5
84-5	7 May 84	Superseded by ETL 84-8, 86-11, 86-18, 88-6
84-6	Not Issued	Cancel l ed/Not Used
84-8	19 Jun 84	Superseded by ETL 86-11
84-9	5 Jul 84	Superseded by ETL 88-7
88-5	2 Aug 88	Superseded by ETL 91-6
86-1	3 Feb 86	Superseded by ETL 87-7
86-3	21 Feb 86	Superseded by ETL 86-4
86-6	3 Jun 86	Superseded by ETL 86-11, 86-18, 88-6
86-7	3 Jun 86	Superseded by ETL 86-15
86-11	3 Jul 86	Superseded by ETL 88-6
86-12	3 Jul 86	Superseded by ETL 90-2
86-13	18 Aug 86	Superseded by ETL 86-14
86-15	13 Nov 86	Superseded by ETL 87-5
86-17	17 Dec 86	Superseded by ETL 89-6
86-18	18 Dec 86	Superseded by ETL 88-6
87-3	12 Mar 87	Superseded by ETL 87-6, ETL 88-6
87-5	13 Jul 87	Superseded by ETL 94-2
87-6	21 Aug 87	Superseded by ETL 88-5
87-7	14 Oct 87	Superseded by ETL 89-1
87-8	19 Oct 87	Superseded by ETL 90-1
88-1	5 Jan 88	Superseded by ETL 89-2
88-5	2 Aug 88	Superseded by ETL 91-6
88-7	24 Aug 88	Superseded by ETL 90-3, ETL 91-2
88-8	4 Oct 88	Superseded by ETL 91-7
89-1	6 Feb 89	Superseded by ETL 90-4
89-5		Issued as ETL 90-7
91-8	24 Sep 91	Cancel ed
91-3	14 Jun 91	Superseded by MIL HDBK 1008B, Jan 94

FROM: HQ AFCESA/ENM
139 Barnes Drive
Tyndall AFB FL 32403-5319

SUBJECT: **Engineering Technical Letter (ETL) 94-4: Energy Usage Criteria for Facilities in the Military Construction Program**

1. Purpose. This ETL:

1.1. Establishes standards and minimum criteria to ensure energy conserving designs are developed for new construction, additions, and major renovation/repair projects for facilities on military installations.

1.2. Establishes reporting requirements for the Air Staff (AF/CEC), MAJCOMs, FOAs, DRUs and bases in the Programming, Design, and Construction (PDC) system.

2. Application. This ETL applies to:

- New facilities.
- All additions.
- Major renovations/repairs. These projects will be programmed and funded to upgrade facilities to new building energy usage levels.

2.1. Authority. This ETL supersedes ETL 87-4, 13 Mar 1987 and ETL 84-2, 27Mar 1984. It contains changes precipitated by the implementation of energy conservation standards specified in the Code of Federal Regulations (10 CFR 435).

2.2. Effective Date: Immediately for projects which have not reached the 10 percent design stage as of the date of this letter.

3. Definitions.

3.1. Major Renovations/Repairs: Changes in the building envelope, and/or replacement of any one or more of the following systems: lighting, HVAC, and water heating.

3.2. Similar Buildings: Buildings which are essentially the same (within 10 percent of the number of square feet, same type of construction, functioning hours of operation, and number of stories) as other existing buildings on the installations which have been the subject of energy conservation analysis.

3.3. Process Energy (including plug loads): Energy consumed in support of all functions other than comfort and amenities for building occupants. Buildings with an excess of 60 percent process energy are exempt from meeting the EUB requirement, but will meet the mandatory minimum compliance standards.

3.4. Energy Use Budget (EUB): The calculated measure, in 1000 BTU/SF/YR (3179 WH/SF/YR), of the maximum allowable energy a building can consume based on weather region and type of facility.

3.5. Building Envelope Heat Transmission (U) factors: Guidance for selecting insulating values is in the Building Envelope Component Guidelines table (Attachment 6)

3.6. Design Energy Usage (DEU): A quantity of energy a building is expected to consume within the five-foot line in BTU/SF/YR, over a 24-hour day and 365-day year, based on design calculations. There is an energy distribution assessment (Attachment 4) for every building - one for each expected nonprocess source of energy load based on the same operating hours as the appropriate EUB. Each building's DEUs will be determined with unique calculations using the Fuel Conversion Factor table (Attachment 5).

3.6.1. Heating DEU (DEUHEAT): Energy used for heating the building environment. It includes the energy of the ventilation system when in the heating mode.

3.6.2. Cooling DEU (DEUCOOL): Energy used for cooling the building environment. It includes the energy of the ventilation system when in the cooling mode.

3.6.3. Ventilation DEU (DEUVENT): Energy used for ventilating the building environment. It is the fan energy for circulating air during an economizer cycle or when in neither the heating nor the cooling mode.

3.6.4. Lighting DEU (DEULIGHT): Energy used for lighting the building.

3.6.5. Domestic Hot Water DEU (DEUDHW): Energy used for heating domestic hot water.

3.6.6. Process Load DEU (DEUPRS): Energy used for process loads.

3.6.7. Special DEU: Energy used from all renewable energy sources such as active solar systems, geothermal, and wind.

3.6.8. Total DEU (TDEU): The sum of DEUHEAT, DEUCOOL, DEUVENT, DEULIGHT, and DEUDHW; does not include DEUPRS or any special DEUs. The PDC will automatically sum these five figures.

NOTE: Energy Budget Figure (EBF) and all variations thereof are superseded by the terminology in this ETL.

4. Specific Requirements. Three methods, described in 10 CFR 435, can be used to meet the energy compliance standards:

- The Prescriptive/System alternative allows only limited flexibility with few tradeoffs in the design criteria. This method requires manual calculations or use of a simplified approved computer program, and is used primarily for small, simple facilities where minimal effort is required to meet energy criteria.
- The Building Energy Cost Compliance alternative **(not used by Air Force)** uses a computer simulation to evaluate design based on annual energy cost.
- The Building Energy method allows greater design flexibility to meet requirements for complex or multi-use facilities and must use an approved computer simulation program.

4.1. Procedure. Follow these steps to meet energy compliance requirements (Attachment 3):

STEP 1: MANDATORY: No exceptions. Prepare proposed designs in the following order:

- (1) envelope/orientation;
- (2) lighting;
- (3) auxiliary system/equipment;
- (4) electric power and distribution;
- (5) HVAC systems and equipment;
- (6) service hot water;
- (7) energy management systems.

Design and size mechanical equipment only after considering all energy conservation improvements to the building. All proposed designs must meet minimum compliance requirements as stated in 10 CFR 435 sections, part A: 3.3, *Lighting*; 4.3, *Auxiliary System/Equipment*; 5.3, *Building Envelope*; 6.3, *Electric Power and Distribution*; 7.3, *HVAC Systems and Equipment*; 9.3, *Service Hot Water*; and 10.3, *Energy Management Systems*.

STEP 2: Calculate compliance using one of the described methods based on design complexity or innovation. **CHOOSE ONE.**

- a. Option 1, Prescriptive/System Alternative: For simple designs and additions/small facilities (under 3000 SF) where minimum effort and calculations are required to meet energy criteria. The Prescriptive method is

the most basic, with minimum flexibility. The System method can be used for more innovative design, allowing flexibility in design of lighting and building envelope sections; but requires more manual calculations than the Prescriptive method. Facilities with a process load exceeding 60 percent must still meet the mandatory requirements in step 1 and use this option for the energy NOT considered process. Recommend using LTSGTD and ENVISTD computer programs, available from ASHRAE or Pacific Northwest Laboratories.

b. Option 2, Building Energy Alternative (computer simulation): For new facilities, additions over 3000 SF, or major renovations/repairs that are heated only or heated and/or air-conditioned. Use an approved, professionally recognized and proven computer program or programs that integrate architectural features with air conditioning, heating, lighting, and other energy-producing or consuming systems. Programs must be capable of simulating the features, systems, and thermal loads used in the design. Using established weather data files, the program must perform 8760 hourly calculations. The Building Load Analysis and Systems Thermodynamics (BLAST) and DOE 2.1C energy analysis programs are recognized by 10 CFR, Part 435, subpart A, as acceptable programs.

Exceptions: Similar buildings in the same climatic zone (heating and cooling degrees days within 5 percent) do not require separate analyses. One computer analysis of the worst-case building (farthest north or north-south orientation) will serve to validate the remaining similar buildings. The MAJCOM or Design Agent shall determine whether or not the prior analysis should be modified with updated energy and construction costs. Document all exceptions, including the justification for not doing the energy analysis, in the project files.

STEP 3: Design compliance: Determine the appropriate EUB from the EUB table (Attachment 7), the Weather Region table (Attachment 8), and the Facility Type table (Attachment 9). Operating hours in the EUB table are provided by facility type. The TDEU must be less than or equal to the EUB. If the TDEU exceeds the EUB, revise the design to incorporate any other economically justified energy conservation measures. Optimize each facility design to its TDEU in addition to meeting the EUB. Document the Compliance Check on a Detailed Summary Form (Attachment 10) and in the PDC. Facilities with a process energy load exceeding 60 percent of the calculated total peak heating and/or cooling load are exempt from meeting the EUB.

STEP 4: Life-Cycle Cost Analysis: Use this analysis together with the energy analysis when evaluating multiple energy alternatives. BLAST's Life Cycle Cost In Design (LCCID) program is approved for this analysis. Other programs must meet the requirements as specified in 10 CFR 436, Part A, *Methodology and Procedures for Life Cycle Cost Analyses* and the Tri-service Memorandum Of Understanding (MOA).

4.2. Responsibilities.

4.1. MAJCOM, FOA, and DRU DMs and bases ensure the Compliance Check is successfully accomplished and documented in the project files.

4.2. MAJCOM, FOA, and DRU DMs and bases update all DEU elements in the PDC Energy screens and provide comments to the Design Agent regarding completeness and adequacy of the Compliance Check. The MAJCOM DM provides comments to AF/CEC regarding completeness and adequacy of the Compliance Check before design is completed.

4.3. HQ AFCESA/EN provides current EUB's, fuel Uniform Present Worth values (UPWs), and escalation rates to AF/CEA for updating the PDC energy screens.

5. Point of Contact: Mr. Freddie L. Beason, HQ AFCESA/ENM, DSN 523-6361 or commercial (904) 283-6361.

EDWARD E. WILSON, PE
Acting Director of Systems Engineering

10 Atch

1. Distribution List
2. ETL Index
3. ETL 94-4 Mandatory Performance Standards Flow Diagram
4. Air Force Energy Distribution Assessment table
5. Fuel Conversion Factors table
6. Building Envelope Component Guidelines table
7. Energy Use Budgets table
8. Weather Region Definitions table
9. Facility Type table
10. Certificate of Compliance Detailed Summary Form

DISTRIBUTION LIST

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Chief of Engineers Department of the Army Attn: CEMP-EA/ Mr. Rick Dahnke 20 Massachusetts Avenue, N.W. Washington DC 20314-1000	(2)
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DEPARTMENT OF DEFENSE

Defense Commissary Service Director of Facilities Bldg 8400 Lackland AFB TX 78236-5000	(1)	Defense Technical Information Center ATTN: DTIC-FDA Alexandria VA 22034-6145	(1)
AAFES/ATTN: CFE PO Box 660320 Dallas TX 75266-0320	(1)		

SPECIAL INTEREST ORGANIZATIONS

HS (A.A. DeSimone) 1990 M Street NW, Suite 400 Washington DC 20036	(1)	Construction Criteria Database National Institute of Bldg Sciences 1201 L Street NW, Suite 400 Washington DC 20005	(1)
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ENGINEERING TECHNICAL LETTERS (ETL)

SECTION A - CURRENT ETLs

ETL Number	Title	Date Issued
83-1	Design of Control Systems for HVAC Change No. 1 to ETL 83-1, U.S. Air Force Standardized Heating, Ventilating & Air Conditioning (HVAC) Control Systems	16 Feb 83 22 Jul 87
83-3	Interior Wiring Systems, AFM 88-15, Para 7-3	2 Mar 83
83-4	EMCS Data Transmission Media (DTM) Considerations	3 Apr 83
83-7	Plumbing, AFM 88-8, Chapter 4	30 Aug 83
83-8	Use of Air-to-Air Unitary Heat Pumps	15 Sep 83
83-9	Insulation Change 1 Ref: HQ USAF/LEEEU Msg 031600Z MAY 84	14 Nov 83 1 Jun 84
84-7	MCP Energy Conservation Investment Program (ECIP)	13 Jun 84
84-10	Air Force Building Construction and the Use of Termiticides	1 Aug 84
86-2	Energy Management and Control Systems (EMCS)	5 Feb 86
86-4	Paints and Protective Coatings	12 May 86
86-5	Fuels Use Criteria for Air Force Construction	22 May 86
86-8	Aqueous Film Forming Foam Waste Discharge Retention and Disposal	4 Jun 86
86-9	Lodging Facility Design Guide	4 Jun 86
86-10	Antiterrorism Planning and Design Guidance	13 Jun 86
86-14	Solar Applications	15 Oct 86
86-16	Direct Digital Control Heating, Ventilation, and Air Conditioning Systems	9 Dec 86
87-1	Lead Ban Requirements of Drinking Water	15 Jan 87
87-2	Volatile Organic Compounds	4 Mar 87
87-5	Utility Meters in New and Renovated Facilities	13 Jul 87
87-9	Prewiring	21 Oct 87
88-2	Photovoltaic Applications	21 Jan 88
88-3	Design Standards for Critical Facilities	15 Jun 88
88-4	Reliability & Maintainability (R&M) Design Checklist	24 Jun 88
88-6	Heat Distribution Systems Outside of Buildings	1 Aug 88
88-9	Radon Reduction in New Facility Construction	7 Oct 88
88-10	Prewired Workstations Guide Specification	29 Dec 88
89-2	Standard Guidelines for Submission of Facility Operating and Maintenance Manuals	23 May 89

ENGINEERING TECHNICAL LETTERS (ETL)

SECTION A - CURRENT ETLs

ETL Number	Title	Date Issued
89-4	Systems Furniture Guide Specification	6 Jul 89
89-6	Power Conditioning and Continuation Interfacing Equipment (PCCIE) in the Military Construction Program (MCP)	7 Sep 89
89-7	Design of Air Force Courtrooms	29 Sep 89
90-1	Built-Up Roof (BUR) Repair/Replacement Guide Specification	23 Jan 90
90-2	General Policy for Prewired Workstations and Systems Furniture	26 Jan 90
90-3	TEMPEST Protection for Facilities Change 1 Ref: HQ USAF/LEEDE Ltr dated 20 April 90, Same Subject	23 Mar 90
90-5	Fuel and Lube Oil Bulk Storage Capacity for Emergency Generators	26 Jul 90
90-6	Electrical System Grounding, Static Grounding and Lightning Protection	3 Oct 90
90-7	Air Force Interior Design Policy	12 Oct 90
90-8	Guide Specifications for Ethylene Propylene Diene Monomer (EPDM) Roofing	17 Oct 90
90-9	Fire Protection Engineering Criteria for Aircraft Maintenance, Servicing, and Storage Facilities	2 Nov 90
90-10	Commissioning of Heating, Ventilating, and Air Conditioning (HVAC) Systems Guide Specification	17 Oct 90
91-1	Fire Protection Engineering Criteria Testing Halon Fire Suppression Systems	2 Jan 91
91-2	High Altitude Electromagnetic Pulse (HEMP) Hardening in Facilities	4 Mar 91
91-4	Site Selection Criteria for Fire Protection Training Areas	14 Jun 91
91-5	Fire Protection Engineering Criteria - Emergency Lighting and Marking of Exits	18 Jun 91
91-6	Cathodic Protection	3 Jul 91
91-7	Chlorofluorocarbon (CFC) Limitation in Heating, Ventilating and Air-Conditioning (HVAC) Systems	21 Aug 91
93-1	Construction Signs	11 Mar 93
93-2	Dormitory Criteria for Humid Areas	13 Jul 93
93-3	Inventory, Screening, Prioritization, and Evaluation of Existing Buildings for Seismic Risk	18 Aug 93

ENGINEERING TECHNICAL LETTERS (ETL)

SECTION A - CURRENT ETLs

ETL Number	Title	Date Issued
93-4	Fire Protection Engineering Criteria - Automatic Sprinkler Systems in Military Family Housing (MFH)	11 Aug 93
93-5	Fire Protection Engineering Criteria - Electronic Equipment Installations	22 Dec 93
94-1	Standard Airfield Pavement Marking Schemes	5 Apr 94
94-2	Utility Meters in New and Renovated Facilities	10 Jun 94
94-3	Air Force Carpet Standard	10 Jun 94
94-4	Energy Usage Criteria for Facilities in the Military Construction Program	19 Aug 94

ENGINEERING TECHNICAL LETTERS (ETL)

SECTION B - OBSOLETE ETLs

ETL Number	Date	Status
82-1	10 Nov 82	Superseded by ETLs 83-10, 86-1, 87-4
82-2	10 Nov 82	Superseded by AFEPPM 88-10
82-3	10 Nov 82	Superseded by ETLs 83-5, 84-2
82-4	10 Nov 82	Superseded by ETL 84-7
82-5	10 Nov 82	Superseded by ETLs 84-1, 86-13, 86-14
82-6	30 Dec 82	Cancelled
82-7	30 Nov 82	Cancelled
83-2	16 Feb 83	Superseded by ETL 84-3
83-5	5 May 83	Superseded by ETL 84-2
83-6	24 May 83	Cancelled
83-10	28 Nov 83	Superseded by ETL 86-1
84-1	18 Jan 84	Superseded by ETL 86-14
84-3	21 Mar 84	Cancelled
84-2	27 Mar 84	Superseded by ETL 94-4
84-4	10 Apr 84	Superseded by ETLs 86-7, 86-15, 87-5
84-5	7 May 84	Superseded by ETLs 84-8, 86-11, 86-18, 88-6
84-6	Not Issued	Cancelled/Not Used
84-8	19 Jun 84	Superseded by ETL 86-11
84-9	5 Jul 84	Superseded by ETL 88-7
88-5	2 Aug 88	Superseded by ETL 91-6
86-1	3 Feb 86	Superseded by ETL 87-7
86-3	21 Feb 86	Superseded by ETL 86-4
86-6	3 Jun 86	Superseded by ETLs 86-11, 86-18, 88-6
86-7	3 Jun 86	Superseded by ETL 86-15
86-11	3 Jul 86	Superseded by ETL 88-6
86-12	3 Jul 86	Superseded by ETL 90-2
86-13	18 Aug 86	Superseded by ETL 86-14
86-15	13 Nov 86	Superseded by ETL 87-5
86-17	17 Dec 86	Superseded by ETL 89-6
86-18	18 Dec 86	Superseded by ETL 88-6
87-3	12 Mar 87	Superseded by ETLs 87-6, ETL 88-5
87-4	13 Mar 87	Superseded by ETL 94-4
87-6	21 Aug 87	Superseded by ETL-88-5
87-7	14 Oct 87	Superseded by ETL 89-1
87-8	19 Oct 87	Superseded by ETL 90-1
88-1	5 Jan 88	Superseded by ETL 89-2
88-5	2 Aug 88	Superseded by ETL 91-6
88-7	24 Aug 88	Superseded by ETLs 90-3, 91-2
88-8	4 Oct 88	Superseded by ETL 91-7
89-1	6 Feb 89	Superseded by ETL 90-4
89-3	9 Jun 89	Superseded by ETL 93-5
89-5		Issued as ETL 90-7
90-4	24 May 90	Cancelled
91-8	24 Sep 91	Cancelled

ENGINEERING TECHNICAL LETTERS (ETL)

SECTION B - OBSOLETE ETLs

ETL Number	Date	Status
91-3	14 Jun 91	Superseded by MIL HDBK 1008B, Jan 94

CONSTRUCTION TECHNICAL LETTERS (CTL)

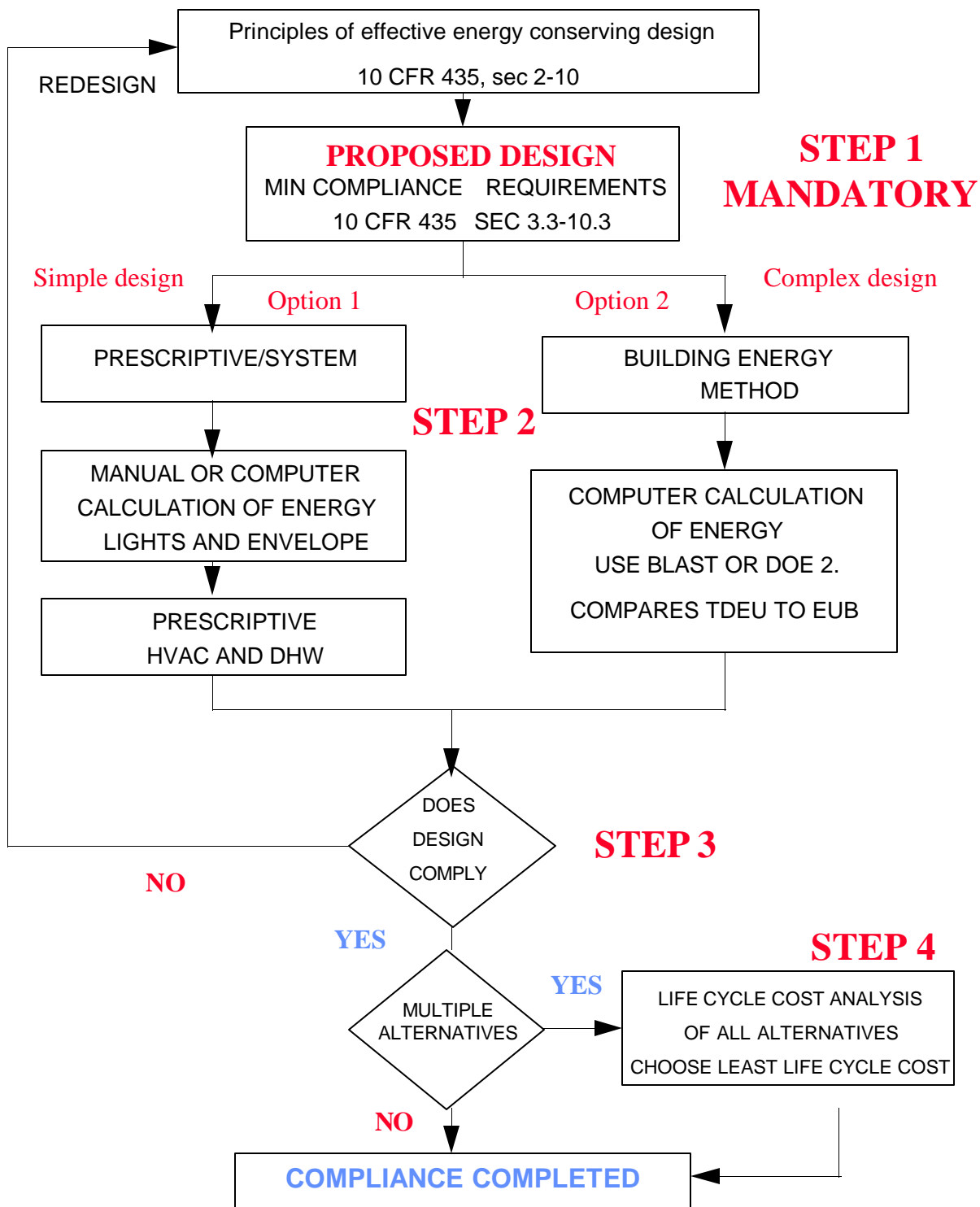
SECTION C - CURRENT CTLs

CTL Number	Date	Status
88-2	DD Form 1354 Checklist	6 Jan 88
88-7	Constructibility Review Checklist	1 Nov 88
89-1	Thirty-Percent Design Submittal	10 Apr 89
89-2	MAJCOM Construction Management	30 May 89
89-3	Warranty and Guarantee Program	22 Sep 89
90-1	Managerment of the MILCON Planning and Execution Process	6 Mar 90
90-2	Definitions for Design Milestones	13 Mar 90

SECTION D - OBSOLETE CTLs

CTL Number	Status
87-1	Superseded by CTL 88-3
88-1	Superseded by CTL 90-1
88-3	Superseded by ETL
88-4	Replaced by Electronic Data File and Documentation in PDC/WIMS
88-5	Superseded by CTL 90-2
88-6	Issuance Cancelled

ETL 94-4 Mandatory Performance Standards Flow Diagram



AIR FORCE ENERGY DISTRIBUTION

<u>FACILITY TYPE (SF)</u>	<u>HEATING</u>	<u>COOLING</u>	<u>LIGHTING</u>	<u>VENT</u>	<u>DHW</u>
Small Offices (<8000)					
for 1000<HDD<7000	25%	20%	40%	10%	5%
for HDD>7000	40%	--	40%	10%	10%
Large Offices (>8000)					
for 1000<HDD<7000	25%	20%	35%	15%	5%
for HDD>7000	40%	--	35%	15%	10%
Hospitals					
for 1000<HDD<4000	20%	40%	20%	15%	5%
for 4000<HDD<7000	40%	15%	20%	15%	10%
for HDD>7000	55%	--	20%	15%	10%
Clinics & Dispensaries					
for 1000<HDD<4000	15%	40%	30%	10%	5%
for 4000<HDD<7000	30%	25%	30%	10%	5%
for HDD>7000	50%	--	30%	10%	10%
Training Facilities					
for 1000<HDD<4000	20%	40%	25%	5%	10%
for 4000<HDD<7000	45%	15%	25%	5%	10%
for HDD>7000	55%	--	25%	5%	15%
Community Type Facilities					
for 1000<HDD<4000	15%	30%	35%	15%	10%
for 4000<HDD<7000	25%	20%	35%	10%	10%
for HDD>7000	40%	--	35%	15%	10%
Dining Facilities					
for 1000<HDD<4000	15%	40%	20%	15%	10%
for 4000<HDD<7000	25%	30%	20%	15%	10%
for HDD>7000	45%	--	20%	20%	15%
Clubs					
for 1000<HDD<4000	20%	35%	15%	20%	10%
for 4000<HDD<7000	30%	30%	15%	15%	10%
for HDD>7000	55%	--	15%	15%	15%

AIR FORCE ENERGY DISTRIBUTION (Continued)

<u>FACILITY TYPE (SF)</u>	<u>HEATING</u>	<u>COOLING</u>	<u>LIGHTING</u>	<u>VENT</u>	<u>DHW</u>
ASSEMBLY TYPE					
FACILITIES					
for 1000<HDD<4000	15%	30%	30%	20%	5%
for 4000<HDD<7000	30%	15%	30%	15%	10%
for HDD>7000	40%	--	30%	15%	15%
STORAGE TYPE					
FACILITIES &					
MAINTENANCE					
FACILITIES					
for 1000<HDD<4000	15%	35%	30%	19%	1%
for 4000<HDD<7000	60%	15%	20%	4%	1%
for HDD>7000	75%	--	20%	4%	1%

FUEL CONVERSION FACTORS

Types of Fuel	Conversion Factors	
	Non-Metric	Metric
Anthracite Coal	25.4 M Btu/short ton	9.17 kWh/ka
Bituminous Coal	24.6 M Btu/short ton	7.971 kWh/ka
Electricity	3.413 Btu/kWh	1 kWh/kWh
No. 2 Distillate Fuel Oil	138.700 Btu/gal	10.775 kWh/liter
Residual Fuel Oil	149.700 Btu/gal	11.63 kWh/liter
Kerosene	135.000 Btu/gal	10.49 kWh/liter
LP Gas	95.500 Btu/gal	7.652 kWh/liter
Natural Gas	1.031 Btu/ft ³	10.66 kWh/m ³
Purchased Steam or Steam from Central Plant	1,000 Btu/lb	0.675 kWh/kg

NOTES:

1. For high temperature, medium temperature, or chilled water from a central plant, use the heat value of fluid based on the actual temperature and pressure delivered to the 5-foot [1.5-meter] line of the designed building.
2. The EUB values assume that no electric resistive heating will be used in the building (except auxiliary electric resistive heating used with heat pump systems). When 10 percent or more of a building's annual heating consumption will be derived from electric resistive heating, multiply the electric resistive calculation by 2.2 to reflect additional conversion losses.
3. At specific installations where the energy source Btu content is known to vary consistently by 10 percent or more from the values given above, the local value may be used, provided there is adequate data on file (two years or more) to justify the revision, and this value is expected to hold true for at least five years following building occupancy.

BUILDING ENVELOPE COMPONENT GUIDELINES^(1,11)
(All U Value Factors are maximums; R value factors are minimum)

Weather Region	Opaque Wall U ⁽²⁾	Gross Wall U ⁽³⁾	Below Grade R ⁽⁴⁾	Glazing Type ⁽⁵⁾	Roof/Ceiling U	Exposed Floor U ⁽⁶⁾
1 ⁽⁷⁾	.053/.040 ⁽⁸⁾	.125/.091 ⁽⁹⁾	18	D/T ⁽¹⁰⁾	.024	.023
2	.053	.147	16	D	.031	.040
3	.053	.147	15	D	.031	.040
4	.066	.164	13	D	.041	.040
5	.064	.181	12	D	.041	.040
6	.092	.210	10	D	.052	.049
7	.088	.212	9	D	.055	.048
8	.120	.217	8 ⁽¹²⁾	S	.066	.074
9	.230	.340	0	S	.100	.180
10	.150	.270	0	S	.057	.100
11	.150	.270	8 ⁽¹²⁾	S	.057	.100

NOTES:

- Values in this table may be used as a starting point in the building design. Use is optional, except Region 1 values are mandatory. Values were derived from guidance in 10 CFR 435 for a typical Air Force building in several representative climatic areas. Depending on the type of building, local construction and energy costs, and microclimate, more energy efficient and/or life cycle cost effective U values (higher or lower) are possible. Final design will depend upon further energy and economic study, generic study results, engineering judgment, or a combination of these. Since many buildings are not "envelope load dominate," use of these values does not guarantee a building's DEU will meet the appropriate EUB value.
- Opaque wall U factors must be calculated in accordance with the ASHRAE *Handbook of Fundamentals*. Calculations must take into account all major thermal bridges, and series and parallel heat conductive paths.
- Gross wall U factor is the average U factor of all wall components (opaque walls, windows, doors, openings) determined by multiplying the respective U factor by the area of each wall component, then dividing the sum of the products for all wall components by the total wall area (weighted average).

NOTES (Continued):

4. Below grade wall R factors are minimum values for exterior wall assemblies (in contact with earth) of below-grade conditioned spaces. Air film coefficients and thermal performance of the adjacent ground are excluded from these values.
5. D = Double glazing with a minimum of 1/4-inch air space.
S = Single glazing with a minimum thickness of 1/8 inch.
T = Triple glazing.
6. Exposed floor U factors are for floors of heated spaces over unheated areas such as open areas, garages, crawl spaces, and basements without a positive heat supply to maintain a minimum temperature of 50° F (10° C).
7. ALL VALUES INDICATED FOR REGION 1 ARE MANDATORY LIMITS. These values have been adjusted to comply with the special minimum requirements for this region in 10 CFR 435 Subpart A.
8. Maximum U factor of 0.40 is required for all buildings with less than 12,000 SF floor area.
9. Maximum U factor of 0.91 is required for all buildings with greater than 12,000 SF floor area.
10. Maximum U factor for fenestration in Region 1 is 0.450, which normally will require double glazing with an emissivity coating or triple glazing. No translucent roofing systems (skylights, light monitors) are permitted in Region 1.
11. Refer to CEGS 03300 for mandatory slab on grade perimeter insulation requirements.
12. For locations in Regions 8 and 11 having Heating Degree Days less than 3000, the below grade wall R factor may be 0.

ENERGY USE BUDGETS (1,000 BTU/SF/YR)													
Facility Type*	Weather Regions**											Hours/ Day	Days/ Week
	1	2	3	4	5	6	7	8	9	10	11		
A1	55	55	45	45	45	45	40	35	35	40	40	10	5
A2	45	45	40	40	40	40	35	35	30	35	35	10	5
B	145	135	125	115	125	115	105	100	100	105	110	24	7
C	55	45	45	45	45	45	35	35	35	35	35	10	5
D	60	55	60	45	50	40	45	50	40	45	45	10	5
E	70	65	65	65	65	65	50	45	35	40	55	10	5
F	60	60	55	55	50	50	45	45	40	45	50	24	7
G	50	50	45	45	45	40	40	35	40	40	50	10	5
H	85	75	65	60	60	55	45	40	30	35	45	24	7
I	85	75	65	60	60	55	45	40	30	35	45	10	5
J	80	70	65	60	55	55	45	40	35	40	40	10	5
K	60	60	55	55	50	50	50	40	40	45	50	16	7
L	70	70	70	65	65	65	65	60	55	65	65	16	7
M	65	65	60	60	55	55	50	50	45	50	50	8	7
N	70	70	65	65	65	60	60	55	55	65	70	16	7
O	60	60	55	45	40	40	35	25	25	25	30	3	5
P	60	60	55	45	40	40	30	25	20	20	25	10	5
Q	70	65	60	55	55	45	45	45	40	45	50	16	7
R	75	65	65	55	55	50	40	35	25	30	45	24	7
S	55	50	45	40	35	25	20	15	15	20	20	24	7
T	45	65	70	80	85	85	85	80	70	75	90	24	7
U1	105	95	85	80	80	75	65	55	50	70	70	24	6
U2	90	80	70	65	65	60	50	50	45	50	60	24	6
V	100	95	85	80	80	70	65	55	55	55	65	12	6
W	95	95	80	75	65	65	55	45	40	45	55	10	5
X	35	30	30	25	25	20	20	20	15	20	20	24	7

*See Attachment 9.

**See Attachment 8.

NOTES:

1. DEUs and EUBs do not predict actual energy consumption for the completed facility. They are only guidelines for determining the relative energy consciousness of energy alternative models. Used in this context, a building design that complies with its EUB, all other factors being equal, will very likely consume less energy than one that does not.

2. The EUB, given in 1,000 BTU/SF/YR [3179 WH/SM/YR], pertains to the energy consumed by buildings within the 5-foot [1.5-meter] line of the building with the following exceptions:

- Include energy required to operate energy plants, systems, and equipment (including distribution system losses and gains) which rest outside the 5-foot [1.5-meter] line, and which serve a single building (such as a remote packaged chiller, cooling tower, substation, or heating plant) in total in the DEU of the designed building.
- Include energy furnished by plants as steam, high or medium temperature hot water, or chilled water, which serve more than one building in the DEU calculation of the designed building. Allow credit for energy content of condensate of water returning to the central plant. Do not include energy losses and gains from the distribution system between the plant and the buildings, as well as the energy conversion losses of the plant itself (other than that taken into account in the fuel conversion factors table) in the connected building's DEU.

3. If another distinct function (facility type) is being performed in the area which comprises 10 percent or more the building's gross floor area, normalize the EUB by using the following formula:

$$EUB = EUB1 (A1/AT) + EUB2 (A2/AT) + + EUBN (AN/AT)$$

where:

EUB is for the mixed use building,

EUBN is for one of the distinct functional areas,

AN is the gross floor area devoted to function N, and

AT is the total gross floor area of the building.

4. The gross floor area of a building is the sum of all floor areas, measured from the outside of exterior walls or from the center line of partitions, including basements, cellars, mezzanines, other intermediate floor tiers, and penthouses.

WEATHER REGION DEFINITIONS

Weather Region	Cooling Degree Days	Heating Degree Day Range (Base 65 °F)	
1	N/A	>15000	N/A
2	N/A	>13000	≤15,000
3	N/A	>11000	≤13,000
4	<2000	>9000	≤11,000
5	<2000	>7000	≤9000
6	<2000	>5500	≤7000
7	<2000	>4000	≤5500
8	<2000	>2000	≤4000
9	<2000	N/A	≤2000
10	>2000	N/A	≤2000
11	>2000	>2000	N/A

NOTES:

1. Use data in AFM 88-29 to select the appropriate weather region.
2. Weather Regions 1, 2, and 3 are determined by the Heating Degree Day Range independent of the Cooling Degree Day.
3. Weather Regions 4, 5, 6, 7, 8, and 9 are determined by the Cooling Degree Days being less than 2000, and then by the appropriate range bracket of the Heating Degree Day.
4. Weather Regions 10 and 11 are determined by the Cooling Degree Days being greater than 2000, and then by the appropriate range bracket of Heating Degree Day.

FACILITY TYPE		
Facility Type	Facility Function	Limitations
A1	Admin, Operations, Office, Police Stations	(Over 8,000 SF)
A2		(Under 8,000 SF)
B	Hospital Buildings	None
C	Medical/Dental Laboratories	None
D	Dental Clinics	None
E	Dispensaries	None
F	Prisons	None
G	Schools, Training and Education Centers, Classrooms, Child Care	None
H	Fire Stations	None
I	Auto Hobby Shops	None
J	Post Offices, Chapels, Banks, Libraries, Credit Unions, Thrift Shops, Miscellaneous Recreation Buildings, Arts and Crafts Buildings	None
K	Gyms, Indoor Pool Buildings, Field Houses, Cadet Activity Centers	None
L	Clubs (NCO, Officer's, Recreation, Rod and Gun, Youth Center	None
M	Theaters, Passenger Terminals	None
N	Dining Hall, Cafeteria, Snack Bar, Open Mess, Restaurants	None
O	Auditoriums	None
P	Museums, Memorials	None
Q	UPH, Dormitories, Transient Billeting, Cadet Housing	None
R	Storage (Medical, Munitions, Range Targets, Forms), Medical Logistics, Kennel Support, Material Process Depot	None
S	Storage (Freight, Missile, Ammunitions), Aircraft Shelter, Air Freight Terminal, Range Supplies and Equipment Storage, Indoor Small Arms Range, Parking Shed, Depot Warehouse, Hazardous Material Storage	None
T	Cold Storage	None
U1	Maintenance (Hangars, Tac Shops, Docks, Vehicle Facilities), High Bay Technical Training Areas	Ceilings >10 FT
U2		Ceilings <10 FT
V	Commissary, Base Exchange, Package Store, Service Outlet	None
W	Electronics, Laboratories, Control Towers, Communication Facilities, Instrument Shops	None
X	Utility Plants (Boiler, Electricity Production, Sewage Treatment, Chiller)	None

**CERTIFICATE OF COMPLIANCE
DETAILED SUMMARY**

INSTALLATION: _____ HOST MAJCOM: _____
PROJECT TITLE: _____ PDC NO.: _____
DESIGN AGENT: _____ MAJCOM DM: _____
DESIGN FIRM: _____

ALL REQUIRED DATA HAS BEEN ENTERED INTO THE PDC SYSTEM:

BASE _____ MAJCOM _____ AF/CEC _____

I. BUILDING EUB

	FACILITY TYPES	AREA	EUB	HRS/DAY	DAYS/WK
1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____

OVERALL GROSS SQUARE FOOTAGE: _____ OVERALL EUB: _____

II. BUILDING INTERNAL _____ OCCUPANTS

III. SUMMARY

TITLE	AMOUNT	REMARKS
DEUHEAT	_____	_____
DEUCOOL	_____	_____
DEUVENT	_____	_____
DEULIGHT	_____	_____
DEUDHW	_____	_____
TDEU	_____	_____
DEUPRS	_____	_____
SPECIAL DEU 1	_____	_____
SPECIAL DEU 2	_____	_____

The design agent certifies that this project has been designed to the required Federal performance standards (10 CFR 435) to achieve the maximum practical improvements in energy efficiency and increases in the use of renewable sources of energy at the least life-cycle cost.

DESIGN AGENT: _____ DATE: _____

The construction agent certifies that this completed facility has been constructed IAW the approved design and that all energy systems and equipment are included without substitution, unless approved by the DA.

CONSTRUCTION AGENT: _____ DATE: _____

REVIEWED BY: MAJCOM DM _____ AF/CEC _____ AFCESA/ENM _____



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

JUN 5 2000

FROM: HQAFCEA/CES
139 Barnes Drive, Suite 1
Tyndall AFB FL 32403-5319

SUBJECT: **Engineering Technical Letter (ETL) 00-5: Seismic Design for Buildings and Other Structures**

1. Purpose. This ETL prescribes use of the following criteria publications for seismic evaluation, design, and construction of Air Force facilities:

- U.S. Army Corps of Engineers (USACE) Technical Instruction (TI) 809-4, *Seismic Design for Buildings*
- USACE TI 809-5, *Seismic Evaluation and Rehabilitation for Buildings*

Procedures in TI 809-4 and TI 809-5 are based upon the National Earthquake Hazard Reduction Program (NEHRP) *Recommended Provisions for Seismic Regulations for New Buildings and Other Structures* (FEMA 302/Feb 98) and NEHRP *Guidelines for the Seismic Rehabilitation of Buildings* (FEMA 273/Oct 97). Use of TI 809-4 was effective for the FY 98 program and beyond.

Note: Documents are available (electronic only) at www.hnd.usace.army.mil.

2. Summary of Revisions. This ETL supersedes ETLs 97-10, 97-11, and 97-12. It also replaces these joint-service publications:

- AFM 88-3, Chapter 13 [AFMAN 32-1149V1(I)]/TM 5-809-10, *Seismic Design for Buildings*. (AFM 88-3CH13 will be rescinded.)
- AFM 88-3, Chapter 13, Section A [AFMAN 32-1149V2(I)]/TM 5-809-10-1, *Seismic Design Guidelines for Essential Buildings* (AFM 88-3CH13SecA will be rescinded.)
- AFM 88-3, Chapter 13, Section B [AFMAN 32-1149V3(I)]/TM 5-809-10-2, *Seismic Design Guidelines for Upgrading Existing Buildings* (AFM 88-3CH13SecB will be rescinded.)

3. Application. The HQ AFCEA/CES criteria letter of 9 September 1998 (paragraph 3.1) established that the 1997 edition of the NEHRP *Recommended Provisions for Seismic Regulations for New Buildings and Other Structures* applied to all new design starts beginning with all new construction in the FY 00 construction program. The same letter specified that NEHRP criteria apply to all design starts for new buildings and new additions to existing buildings, regardless of funding source, effective on the date of the letter. These criteria do not apply to projects beyond project definition stage (35 percent design) as of 9 September 1998. The policy established for existing buildings by the AF/ILE letter of 23 April 1997 (paragraph 3.1) continues. Application of NEHRP

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standards to Air Force projects is described in TI 809-04 and TI 809-05. Seismic design procedures of the Uniform Building Code (UBC) are not equivalent.

3.1. Authority:

- AFPD 32-10, *Installations and Facilities*
- AFI 32-1023, *Design and Construction Standards and Execution of Facility Construction Projects*
- HQ USAF/ILE policy letter, 23 April 1997, *Mitigating Existing Building Seismic Deficiencies*
- HQ AFCESA/CES criteria letter, 9 September 1998, *Seismic Design Criteria for New Construction/All Geographic Locations*

3.2. Effective Date: Immediately.

3.3. Ultimate Recipients:

- Base Civil Engineers and other Air Force units responsible for design and construction.
- Corps of Engineers and Navy offices responsible for design and construction of Air Force facilities.

4. Point of Contact: Mr. Myron Anderson, HQ AFCESA/CESC, DSN 523-6164, commercial (850) 283-6164, Internet Myron.Anderson@afcesa.af.mil, FAX (850) 283-6219.

Michael J. Cook, Colonel, USAF
Director of Technical Support

Atch 1
1. Distribution List

DISTRIBUTION LIST

DEPARTMENT OF DEFENSE

Defense Commissary Service Director of Facilities Bldg 8400 Lackland AFB TX 78236-5000	(1)	Defense Technical Information Center ATTN: DTIC-FDA Alexandria VA 22034-6145	(1)
---	-----	---	-----

AAFES/ATTN: CFE PO Box 660320 Dallas TX 75266-0320	(1)
--	-----

SPECIAL INTEREST ORGANIZATIONS

IHS (S. Carter) 15 Inverness Way East Stop A-111 Englewood CO 80112	(1)	Construction Criteria Database National Institute of Bldg Sciences 1201 L Street NW, Suite 400 Washington DC 20005	(1)
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ATTACHMENT NO. 6

SECTION 15951A DIRECT DIGITAL CONTROL FOR HVAC

SECTION 15951A DIRECT DIGITAL CONTROL FOR HVAC

ATTACHMENT NO. 6 - i

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DIVISION 15 - MECHANICAL

SECTION 15951A

DIRECT DIGITAL CONTROL FOR HVAC

06/98

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SECTION 15951A

DIRECT DIGITAL CONTROL FOR HVAC

06/98

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

Codes and Regulations: All electrical equipment and material and its installation shall conform to the current requirements of the following authorities; Occupational Safety and Health Act (OSHA); Uniform Building Code; National Fire Code; National Electrical Code; Uniform Mechanical Code; National Standard Plumbing Code; UL916

Note: Where two or more codes conflict, the most restrictive shall apply. Nothing in these plans and specifications shall be construed to permit work not conforming to applicable codes.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B40.1 (1991) Gauges - Pressure Indicating Dial
Type - Elastic Element

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE Std 142 (1991) IEEE Recommended Practice for
Grounding of Industrial and Commercial
Power Systems

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA 250 (1991) Enclosures for Electrical Equipment
(1000 Volts Maximum)

NEMA ICS 1 (1993) Industrial Control and Systems

NEMA ST 1 (1988) Specialty Transformers (Except
General-Purpose Type)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (1999) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL 508

(1993; Rev thru Oct 1997) Industrial
Control Equipment

1.2 GENERAL REQUIREMENTS

The direct digital control (DDC) shall be a complete system suitable for the heating, ventilating and air-conditioning (HVAC) system. The Contractor shall utilize the existing Operator Workstation located in the building 430. The system specified in this document is an extension of the existing Native BACnet DDC control system. See paragraph Building Systems Integration. .

Standard Products

Material and equipment shall be the standard products of Delta Controls or equal or of other manufacturers as described herein, and each component shall provide the discrete functions indicated. Combining of components or discrete component functions by using multiple function devices which have not been indicated, and deviation from indicated logic shall not be permitted. Items of equipment (individual control system components such as pressure sensors, controllers, temperature probes) shall essentially duplicate equipment that has been in satisfactory use at least 2 years prior to bid opening. All equipment, including installation materials, shall conform to the requirements of the Buy American Act or shall be of American manufacture and assembly. Specific acceptable items of foreign manufacture are identified herein. Any equipment or material which does not meet these requirement shall be subject to removal and replacement at no additional cost to the Government.

Identical Items

Items of equipment that perform the same function shall be identical, including equipment, assemblies, parts, and components.

Configuration

The Contractor shall configure the Direct Digital Control (DDC) system as described and shown. System shall be listed per UL 916. Direct Digital Control panels shall be fully capable of controlling their respective systems with or without communication with any host computer system. All computing devices, as defined in FCC rules and Regulations, Part 15, shall be certified to comply with the requirements for Class A computing devices and labelled as set forth in FCC Rules and Regulations Part 15, Subpart J. The system shall provide operator interaction through a Delta Controls workstation or at a local operators terminal. DDC panels shall manage all control functions within their data environment as specified. Every connected analog output (AO), analog input (AI), Binary output (BO), and Binary input (BI), represents a point where referred to in this specification.

Connection to Base-Wide Native BACnet System

The contractor shall be responsible for connection and integration of the Direct Digital Control (DDC) system to the existing base-wide Native BACnet Energy Management and Control System (EMCS). This includes providing all equipment, cabling, software, programming, installation, commissioning, and training unless noted otherwise.

Database Definition and Graphic Generation

Contractor shall generate required database definitions compatible with the existing EMCS databases. They shall also generate complete and accurate dynamic graphics representations of each air handling unit system and all other systems as identified in the I/O summary charts as well as complete building floor plans showing individual space sensed and set point temperature and humidity conditions.

Extension of Base EMCS Fiber-optic Network

This section covers required network cabling and equipment in each building from communications patch panel, located in the communications room, to the Operator Workstations and Master DDC System Controller. Extension of EMCS' dedicated fiber-optic cable from nearest source to each building's communications patch panel is provided under Section 01007 ELECTRICAL REQUIREMENTS, paragraphs EMCS DISTRIBUTION & INTERIOR COMMUNICATIONS SYSTEM

1.2.1 Nameplates, Lens Caps, and Tags

Nameplates and lens caps bearing legends tags bearing device-unique identifiers shall have engraved or stamped characters. A plastic or metal tag shall be mechanically attached directly to each device or attached by a metal chain or wire.

1.2.2 Verification of Dimensions

After becoming familiar with all details of the work, the Contractor shall verify all dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing any work.

1.2.3 Drawings

Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings, and accessories that may be required. The Contractor shall carefully investigate the mechanical, electrical, and finish conditions that could affect the work to be performed, shall arrange such work accordingly, and shall furnish all work necessary to meet such conditions.

1.2.4 OVERVIEW

This document contains the minimum specification, input/output summaries for a Native BacNet Direct Digital Control (DDC) system for this project. The system architecture shall utilize intelligent distributed control modules, located at each site, which directly communicate over an EIA-485 BacNet controller network. Operator Workstations may be connected to the controller network via direct EIA-232, modem, or EtherNet local area network connections through a microprocessor based communication device.

The Operator Workstations shall utilize the existing Windows 95 compatible computers with color monitor and associated printer, and are located at building 320. The system shall provide the Direct Digital Control (DDC), Energy Management, and Building Automation for the air conditioning, heating and ventilating systems and shall interface with other micro-processor based systems as shown on the drawings and as specified.

1.2.5 BACnet COMPATIBILITY

The system must be fully BACnet compatible at the time of bid. This means that the system must use BACnet as the native communication protocol (no "gateways", translators, etc.) between controllers and must, as a minimum, be Conformance Class 3 and support the following Objects;

- Binary Input
- Binary Output
- Binary Value
- Analog Input
- Analog Output
- Analog Value

The communication network between controllers must be EIA-485, using 156 kbps ARCNET at the Data Link Layer for primary equipment controllers (AHU's, Pumps, chillers, etc.) and at least 38.4 Kbps MSTP for all room level terminal controls.

If the system is not fully BACnet compatible (Native Language) at the time of the bid, the vendors bid shall be in noncompliance with the specification and shall be deemed nonresponsive. Systems which are not BacNet compatible as specified above are not acceptable.

1.2.6 INSTRUCTIONS TO BIDDERS

The system specified in this document is an extension of the existing Native BACnet DDC control system or equal.

1.2.7 SCOPE OF WORK

A. Contractor's Responsibilities

A The Contractor shall furnish and install all necessary hardware, wiring, computing equipment and software as defined in this specification.

B System Requirements

(1) All material and equipment used shall be standard components, regularly manufactured and available, and not custom designed especially for this project. All systems and components, except site specific software, shall have previously been thoroughly tested and proven in actual use prior to installation on this project.

(2) The system architecture shall be fully modular permitting expansion of application software, system peripherals, and field hardware.

(3) The system, upon completion of the installation and prior to acceptance of the project, shall perform all operating functions as detailed in this specification.

C Equipment

(1) System Hardware

The Contractor shall provide the following:

- (a) Operator Workstation(s) and Control Modules
- (b) All sensing devices and necessary transducers to perform the functions listed in I/O Summary Tables
- (c) All relays, switches, indicating devices, and transducers required to

perform the functions listed in I/O Summary Tables

- (d) All monitoring and control wiring
- (e) All modems and accessories

(2) System Software

The Contractor shall provide all software identified in Part 3 of this specification. The database required for implementation of these specification shall be provided by the Contractor, including: point descriptor, alarm limits, calibration variables, graphics, reports and point summaries.

D. Input/Output Summary Table

The system as specified shall monitor, control, and calculate all of the points and perform all the functions as listed in I/O Summary Tables.

1.2.8 GENERAL CONDITIONS

A. Changes in the Work

Within the general scope of the contract, The Contracting Officer, without invalidating the contract may order changes in the work consisting of additions, deletions, or other revisions, the contract sum and the contract time being adjusted accordingly. All such changes in the work shall be authorized by written Change Order, and shall be executed under the applicable conditions of the Contract Documents.

B. Correction of Work

(1) The Contractor shall promptly correct all work The Contracting Officer finds defective or failing to conform to the Contract Documents. The Contractor shall bear all cost of correcting such work.

(2) If, within the warranty period required by the Contract Documents, any of the work is found to be defective or not in accordance with the contract documents, the Contractor shall correct it promptly after receipt of a written notice from The Contracting Officer to do so. The Contractor Officer shall give notice promptly after discovery of the condition.

C. Coordination During Construction

(1) The Contractor shall coordinate any necessary changes in work scheduling with The Contracting Officer to minimize the disruption.

(2) The Contractor shall protect the installed works by other trades.

(3) The Contractor shall coordinate with other trades.

(4) The Contractor shall repair any damage caused by his work to building(s) and equipment at no additional cost to Government.

D. Warranty

The Contractor shall warrant that all systems, subsystems, component parts, and software are fully free from defective design, materials, and workmanship for a period of one year from the date of final acceptance by

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

HVAC Control System; G-AE.

Drawings shall be on 34 by 22 inch sheets in the form and arrangement shown. The drawings shall use the same abbreviations, symbols, nomenclature and identifiers shown. Each control system element on a drawing shall have a unique identifier as shown. The HVAC Control System Drawings shall be delivered together as a complete submittal. Deviations must be approved by the Contracting Officer. Drawings shall be submitted along with Submittal SD-01, Data.

a. HVAC Control System Drawings shall include the following:

Sheet One: Drawing Index, HVAC Control System Legend.
Sheet Two: Valve Schedule, Damper Schedule.
Sheet Three: Not Used.
Sheet Four: Control System Schematic and Equipment Schedule.
Sheet Five: Sequence of Operation .
Sheet Six: Control Loop Wiring Diagrams.
Sheet Seven: Motor Starter and Relay Wiring Diagram.
Sheet Eight: Communication Network and Block Diagram.
Sheet Nine: DDC Panel Installation and Block Diagram.

(Repeat Sheets Four through Seven for each AHU System.)

b. The HVAC Control System Drawing Index shall show the name and number of the building, site, State or other similar designation, and Country. The Drawing Index shall list HVAC Control System Drawings, including the drawing number, sheet number, drawing title, and computer filename when used. The HVAC Control System Legend shall show generic symbols and the name of devices shown on the HVAC Control System Drawings.

c. The valve schedule shall include each valve's unique identifier, size, flow coefficient Cv, pressure drop at specified flow rate, spring range, positive positioner range, actuator size, close-off pressure data, dimensions, and access and clearance requirements data. Valve schedules may be submitted in advance but shall be included in the complete submittal.

d. The damper schedule shall contain each damper's and each actuator's identifier, nominal and actual sizes, orientation of axis and frame, direction of blade rotation, spring ranges, operation rate, positive positioner ranges, locations of actuators and damper end switches, arrangement of sections in multi-section dampers, and methods of connecting dampers, actuators, and linkages. The Damper Schedule shall include the maximum leakage rate at the operating static-pressure differential. The Damper Schedule shall contain actuator selection data supported by calculations of the torque required to move and seal the dampers, access and clearance requirements. Damper schedules may be submitted in advance but shall be included in the complete submittal.

e. Not UsedT.

f. The HVAC control system schematics shall be in the form shown, and shall show all control and mechanical devices associated with the HVAC system. A system schematic drawing shall be submitted for each HVAC system.

g. The HVAC control system equipment Schedule shall be in the form shown. All devices shown on the drawings having unique identifiers shall be referenced in the equipment schedule. Information to be included in the equipment schedule shall be the control loop, device unique identifier, device function, setpoint, input range, and additional important parameters (i.e., output range). An equipment schedule shall be submitted for each HVAC system.

h. The HVAC control system sequence of operation shall reflect the language and format of this specification, and shall refer to the devices by their unique identifiers. No operational deviations from specified sequences will be permitted without prior written approval of the Contracting Officer. Sequences of operation shall be submitted for each HVAC control system including each type of terminal unit control system.

i. The HVAC control system wiring diagrams shall be functional wiring diagrams which show the interconnection of conductors and cables to HVAC control panel terminal blocks and to the identified terminals of devices, starters and package equipment. The wiring diagrams shall show necessary jumpers and ground connections. The wiring diagrams shall show the labels of all conductors. Sources of power required for HVAC control systems and for packaged equipment control systems shall be identified back to the panel board circuit breaker number, HVAC system control panel, magnetic starter, or packaged equipment control circuit. Each power supply and transformer not integral to a controller, starter, or packaged equipment shall be shown. The connected volt-ampere load and the power supply volt-ampere rating shall be shown. Wiring diagrams shall be submitted for each HVAC control system.

j. Six copies shop drawings shall be submitted and shall consist of a complete list of equipment and materials, including manufacturer's descriptive and technical literature, catalog cuts, and installation instructions. Shop drawings shall also contain complete wiring, routing, schematic diagrams, tag number of devices, software descriptions, calculations, and any other details required to demonstrate that the system will function properly. Drawings shall show proposed layout and installation of all equipment and the relationship to other parts of the work.

Shop drawings shall be approved before any equipment is installed. Therefore, shop drawings must be submitted in time for Contracting Officer's review so that all installations can be completed per the project's completion schedule. Twenty working days shall be allowed for The Contracting Officer to review submittals.

All drawings shall be reviewed after the final system checkout and updated or corrected to provide 'as-built' drawings to show exact installation. All shop drawings will be acknowledged in writing by Contracting Officer before installation is started and again after the final checkout of the system. The system will not be considered complete until the 'as-built' drawings have received their final approval. The Contractor shall deliver <6> sets of 'as-built' drawings.

Before final configuration, the Contractor shall provide I/O Summary forms to Contracting Officer that include:

- (a) Description of all points
- (b) Listing of binary and analog hardware required to interface to the equipment for each function
- (c) Listing of all application programs associated with each piece of equipment
- (d) Failure modes for control functions to be performed in case of failure

k. The Contractor shall provide an accurate graphic flow diagram for each software program proposed to be used on the project as part of the submittal process. Revisions made as a result of the submittal process, during the installation, start-up or acceptance portion of the project, shall be accurately reflected in the "as-built" graphic software flow diagrams herein required by this specification.

SD-03 Product Data

Equipment Compliance Booklet; G-AE.

The HVAC Control System Equipment Compliance Booklet (ECB) shall be in booklet form and indexed, with numbered tabs separating the information on each device. It shall consist of, but not be limited to, data sheets and catalog cuts which document compliance of all devices and components with the specifications. The ECB shall be indexed in alphabetical order by the unique identifiers. Devices and components which do not have unique identifiers shall follow the devices and components with unique identifiers and shall be indexed in alphabetical order according to their functional name. The ECB shall include a Bill of Materials for each HVAC Control System. The Bill of Materials shall function as the Table of Contents for the ECB and shall include the device's unique identifier, device function, manufacturer, model/part/catalog number used for ordering, and tab number where the device information is located in the ECB. The ECB shall be submitted along with Submittal SD-04, Drawings.

SD-06 Test Reports

Commissioning Report; G-AE

Six copies of the HVAC Control System Commissioning Report, in booklet form and indexed, within 30 days after completion of the system commissioning. The commissioning report shall include data collected during the HVAC control system commissioning procedures and shall follow the format of the commissioning procedures. The commissioning report shall include all configuration checksheets with final values listed for all parameters, setpoints, P, I, D setting constants, calibration data for all devices, results of adjustments, and results of testing.

Performance Verification Test Report; G-AE

Six copies of the HVAC Control System Performance Verification Test Report, in booklet form and indexed, within 30 days after completion of the test. The HVAC control system performance verification test report shall include data collected during the HVAC control system performance verification test. The original copies of all data gathered during the performance verification test shall be turned over to the Government after Government approval of the test results.

SD-07 Certificates

Commissioning Procedures; G-AE.

Six copies of the HVAC control system commissioning procedures, in booklet form and indexed, 60 days prior to the scheduled start of commissioning. Commissioning procedures shall be provided for each HVAC control system, and for each type of terminal unit control system. The Commissioning procedures shall reflect the format and language of this specification, and refer to devices by their unique identifiers. The Commissioning procedures shall be specific for each HVAC system, and shall give detailed step-by-step procedures for commissioning of the system.

a. The Commissioning procedures shall include detailed, product specific set-up procedures, configuration procedures, adjustment procedures, and calibration procedures for each device. Where the detailed product specific commissioning procedures are included in manufacturer supplied manuals, reference may be made in the HVAC control system commissioning procedures to the manuals.

b. An HVAC control system commissioning procedures equipment list shall be included that lists the equipment to be used to accomplish commissioning. The list shall include manufacturer name, model number, equipment function, the date of the latest calibration, and the results of the latest calibration.

Performance Verification Test Procedures; G-AE.

Six copies of the HVAC Control System Performance Verification Test Procedures, in booklet form and indexed, 60 days before the Contractor's scheduled test dates. The performance verification test procedures shall refer to the devices by their unique identifiers, shall explain, step-by-step, the actions and expected results that will demonstrate that the HVAC control system performs in accordance with the sequences of operation, and other contract documents. An HVAC control system performance verification test equipment list shall be included that lists the equipment to be used during performance verification testing. The list shall include manufacturer name, model number, equipment function, the date of the latest calibration, and the results of the latest calibration.

Training Course Materials; G-AE

An outline for the HVAC control system training course with a proposed time schedule. Approval of the planned training schedule shall be obtained from the Government at least 60 days prior to the start of the training. Six copies of HVAC control system training course material 30 days prior to the scheduled start of the training course. The training course material shall include the operation manual, maintenance and repair manual, User manual, Engineering manual, Software documentation and paper copies of overheads used in the course.

ASME Air-Storage Tank Certificate; G-RE

An ASME Air-Storage Tank Certificate for each storage tank.

SD-10 Operation and Maintenance Data

Operation Manual/Maintenance and Repair Manual; G-AE

Six copies of the HVAC Control System Operation Manual, User's manual, Engineering manual, software documentation and HVAC Control System Maintenance and Repair Manual, for each HVAC control system, 30 days before the date scheduled for the training course.

Project Specific Manuals

Reference manuals for the system shall include the following categories: Users Manual, Engineering Handbook, and software documentation. Project specific manuals shall include detailed information describing the specific installation at F.E. Warren AFB.

Users Manual

a. System reference material shall contain as a minimum, an overview of the system, its organization, the concepts of networking and operator workstation/field hardware relationships as well as the following:

- (1) Activating the operator workstation
- (2) Using the mouse
- (3) Operator Workstation screen menus and their definitions
- (4) Establishing setpoints and schedules
- (5) Uploading and downloading software, setpoints, schedules, operating parameters and status between the operator workstation and field hardware
- (6) Collecting trend data and generating trend plots
- (7) Enabling alarms and messages
- (8) Report generation
- (9) Backing up software and data files
- (10) Using the operator workstation with 'third party' software

Engineering Manual

a. It shall include detailed information on:

- (1) Hardware--cutsheets and product descriptions.
- (2) Engineering--design requirements for initial installations and/or additions to existing systems .
- (3) Installation--mounting and connection details for field hardware, accessories and operator workstation equipment.
- (4) Field hardware set-up, checkout and tuning techniques.
- (5) Operator Workstation set-up, software loading and checkout techniques
- (6) A listing of basic terminology, standard alarms and messages, error messages and frequently used commands.

Software Documentation

(a) Shall contain as a minimum descriptions of the control software programs used in the system. Descriptions shall include:

- (1) Diagrams and listings showing maximum input/output point configurations for controlled equipment.
- (2) A description of the control elements and sequences available for the equipment.
- (3) A listing of the information which is displayed to the operator for each piece of controlled equipment.
- (4) A listing of the alarm and message conditions which may be detected for each piece of controlled equipment and the standard alarm and message texts which can be displayed when those conditions exist.
- (5) A graphic flow diagram for each software application program provided

as part of this project.

1.4 DELIVERY AND STORAGE

Products shall be stored with protection from the weather, humidity and temperature variations, dirt and dust, and other contaminants, within the storage condition limits published by the equipment manufacturer. Dampers shall be stored so that seal integrity, blade alignment and frame alignment are maintained.

1.5 OPERATION MANUAL

An HVAC control system operation manual in indexed booklet form shall be provided for each HVAC control system. The operation manual shall include the HVAC control system sequence of operation, and procedures for the HVAC system start-up, operation and shut-down. The operation manual shall include as-built HVAC control system detail drawings. The operation manual shall include the as-built configuration checksheets, the procedures for changing HVAC control system setpoints, and the procedures for placing HVAC system controllers in the manual control mode.

a. The procedures for changing HVAC control system setpoints shall describe the step-by-step procedures required to change the process variable setpoints, the alarm setpoints, the bias settings, and setpoint reset schedules.

b. The procedures for placing HVAC system controllers in the manual control mode shall describe step-by-step procedures required to obtain manual control of each controlled device and to manually adjust their positions.

1.6 MAINTENANCE AND REPAIR MANUAL

An HVAC control system maintenance and repair manual in indexed booklet form in hardback binders shall be provided for each HVAC control system. The maintenance and repair manual shall include the routine maintenance checklist, a recommended repair methods list, a list of recommended maintenance and repair tools, the qualified service organization list, the as-built commissioning procedures and report, the as-built performance verification test procedures and report, and the as-built equipment data booklet.

a. The routine maintenance checklist shall be arranged in a columnar format. The first column shall list all devices listed in the equipment compliance booklet, the second column shall state the maintenance activity or state no maintenance required, the third column shall state the frequency of the maintenance activity, and the fourth column for additional comments or reference.

b. The recommended repair methods list shall be arranged in a columnar format and shall list all devices in the equipment data compliance booklet and state the guidance on recommended repair methods, either field repair, factory repair, or whole-item replacement.

c. The as-built equipment data booklet shall include the equipment compliance booklet and manufacturer supplied user manuals and information.

d. If the operation manual and the maintenance and repair manual are provided in a common volume, they shall be clearly differentiated and

separately indexed.

1.7 MAINTENANCE AND SERVICE

Services, materials and equipment shall be provided as necessary to maintain the entire system in an operational state as specified for a period of one year after successful completion and acceptance of the Performance Verification Test. Impacts on facility operations shall be minimized.

1.7.1 Description of Work

The adjustment and repair of the system shall include the manufacturer's required adjustments of computer equipment, software updates, transmission equipment and instrumentation and control devices.

1.7.2 Personnel

Service personnel shall be qualified to accomplish work promptly and satisfactorily. The Government shall be advised in writing of the name of the designated service representative, and of any changes in personnel.

1.7.3 Scheduled Inspections

Two inspections shall be performed at six-month intervals (or less if required by the manufacturer), and all work required shall be performed. Inspections shall be scheduled in June and December. These inspections shall include:

- a. Visual checks and operational tests of equipment.
- b. Fan checks and filter changes for control system equipment.
- c. Clean control system equipment including interior and exterior surfaces.
- d. Check and calibrate each field device. Check and calibrate 50 percent of the total analog points during the first inspection. Check and calibrate the remaining 50 percent of the analog points during the second major inspection. Certify analog test instrumentation accuracy to be twice that of the device being calibrated. Randomly check at least 25 percent of all digital points for proper operation during the first inspection. Randomly check at least 25 percent of the remaining digital points during the second inspection.
- e. Run system software diagnostics and correct diagnosed problems.
- f. Resolve any previous outstanding problems.

1.7.4 Scheduled Work

This work shall be performed during regular working hours, Monday through Friday, excluding legal holidays.

1.7.5 Emergency Service

The Government will initiate service calls when the system is not functioning properly. Qualified personnel shall be available to provide service to the system. A telephone number where the service supervisor can

be reached at all times shall be provided. Service personnel shall be at the site within 24 hours after receiving a request for service. The control system shall be restored to proper operating condition within three calendar days after receiving a request for service.

1.7.6 Operation

Scheduled adjustments and repairs shall include verification of the control system operation as demonstrated by the applicable tests of the performance verification test.

1.7.7 Records and Logs

Dated records and logs shall be kept of each task, with cumulative records for each major component, and for the complete system chronologically. A continuous log shall be maintained for all devices. The log shall contain initial analog span and zero calibration values and digital points. Complete logs shall be kept and shall be available for inspection onsite, demonstrating that planned and systematic adjustments and repairs have been accomplished for the control system.

1.7.8 Work Requests

Each service call request shall be recorded as received and shall include the serial number identifying the component involved, its location, date and time the call was received, nature of trouble, names of the service personnel assigned to the task, instructions describing what has to be done, the amount and nature of the materials to be used, the time and date work started, and the time and date of completion. A record of the work performed shall be submitted within 5 days after work is accomplished.

PART 2 PRODUCTS

2.1 GENERAL EQUIPMENT REQUIREMENTS

Units of the same type of equipment shall be products of a single manufacturer. Each major component of equipment shall have the manufacturer's name and address, and the model and serial number in a conspicuous place. Materials and equipment shall be standard products of a manufacturer regularly engaged in the manufacturing of such products, which are of a similar material, design and workmanship. The standard products shall have been in a satisfactory commercial or industrial use for two years prior to use on this project. The two years' use shall include applications of equipment and materials under similar circumstances and of similar size. The two years' experience shall be satisfactorily completed by a product which has been sold or is offered for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures. Products having less than a two-year field service record will be acceptable if a certified record of satisfactory field operation, for not less than 6,000 hours can be shown. The equipment items shall be supported by a service organization. Items of the same type and purpose shall be identical, including equipment, assemblies, parts and components. Automatic temperature controls shall be direct digital controls that will provide the required sequence of operation. Is an extension of the existing Native BACnet DDC control system or equal.

2.1.1 Electrical and Electronic Devices

Electrical, electronic, and electropneumatic devices not located within a

DDC panel shall have a NEMA ICS 1 enclosure in accordance with NEMA 250 unless otherwise shown.

2.1.1.2 Standard Signals

Except for air distribution terminal unit control equipment, The output of all analog transmitters and the analog input and output of all DDC controllers shall be 4-to-20 mA_{dc} signals. The signal shall originate from current-sourcing devices and shall be received by current-sinking devices.

2.1.1.3 Ambient Temperature Limits

DDC panels shall have ambient condition ratings of 35 to 120 degrees F and 10 to 95 percent relative humidity, noncondensing. Devices installed outdoors shall operate within limit ratings of minus 35 to plus 150 degrees F. Instrumentation and control elements shall be rated for continuous operation under the ambient environmental temperature, pressure, humidity, and vibration conditions specified or normally encountered for the installed location.

2.2 NOT USED

2.3 WIRING

2.3.1 Terminal Blocks

Terminal blocks shall be insulated, modular, feed-through, clamp style with recessed captive screw-type clamping mechanism, shall be suitable for rail mounting, and shall have end plates and partition plates for separation or shall have enclosed sides.

2.3.2 Control Wiring for 24-Volt Circuits

Control wiring for 24-volt circuits shall be 18 AWG minimum, stranded copper and shall be rated for 300-volt service.

2.3.3 Wiring for 120-Volt Circuits

Wiring for 120-volt circuits shall be 18 AWG minimum, stranded copper and shall be rated for 600-volt service.

2.3.4 Instrumentation Cable

Instrumentation cable shall be 18 AWG, stranded copper, single- or multiple-twisted, minimum 2 inch lay of twist, 100 percent shielded pairs, and shall have a 300-volt insulation. Each pair shall have a 20 AWG tinned-copper drain wire and individual overall pair insulation. Cables shall have an overall aluminum-polyester or tinned-copper cable-shield tape, overall 20 AWG tinned-copper cable drain wire, and overall cable insulation.

2.3.5 Transformers

Step down transformers shall be utilized where control equipment operates at lower than line circuit voltage. Transformers, other than transformers in bridge circuits, shall have primaries wound for the voltage available and secondaries wound for the correct control circuit voltage. Transformer shall be sized so that the connected load is 80 percent of the rated capacity or less. Transformers shall conform to UL 508 and NEMA ST 1.

2.4 ACTUATORS

Actuators shall be pneumatic and shall be provided with mounting and connecting hardware. Electric or Electronic actuators shall be used for variable air volume (VAV) air terminal units. Actuators shall fail to their spring-return positions on signal or power failure [except that VAV terminal unit actuators may be of the floating type]. The actuator stroke shall be limited in the direction of power stroke by an adjustable stop. Actuators shall have a visible position indicator. Actuators shall smoothly open or close the devices to which they are applied and shall have a full stroke response time of 60 seconds or less. Electric actuators shall have an oil-immersed gear train. Electric or electronic actuators operating in series shall have an auxiliary actuator driver. Electric or Electronic actuators used in sequencing applications shall have an adjustable operating range and start point. Pneumatic actuators shall be rated for 25 psig operating pressure except for high-pressure cylinder-type actuators.

2.4.1 Valve Actuators

Valve actuators shall be selected to provide a minimum of 125 percent of the motive power necessary to operate the valve over its full range of operation.

- a. Electronic direct-coupled actuation shall be provided.
- b. The actuator shall be direct-coupled over the shaft, enabling it to be mounted directly to the damper shaft without the need for connecting linkage. The fastening clamp assembly shall be of a "V" bolt design with associated "V" shaped toothed cradle attaching to the shaft for maximum strength and eliminating slippage. Spring return actuators shall have a "V" clamp assembly of sufficient size to be directly mounted to an integral jackshaft of up to 1.05 inches when the damper is constructed in this manner. Single bolt or screw type fasteners are not acceptable.
- c. The actuator shall have electronic overload or digital rotation sensing circuitry to prevent damage to the actuator throughout the entire rotation of the actuator. Mechanical end switches or magnetic clutch to deactivate the actuator at the end of rotation are not acceptable.
- d. For power-failure/safety applications, an internal mechanical spring return mechanism shall be built into the actuator housing. Non-mechanical forms of fail-safe operation are not acceptable.
- e. All spring return actuators shall be capable of both clockwise or counterclockwise spring return operation by simply changing the mounting orientation.
- f. Proportional actuators shall accept a 0 to 10 VDC control input and provide a 2 to 10 VDC operating range. An actuator capable of accepting a pulse width modulating control signal and providing full proportional operation of the damper is acceptable. All actuators shall provide a 2 to 10 VDC position feedback signal.
- g. All 24 VAC/DC actuators shall operate on Class 2 wiring and shall not require more than 10 VA for AC or more than 8 watts for DC applications. Actuators operating on 120 VAC power shall not require more than 10 VA. Actuators operating on 230 VAC shall not require more than 11 VA.

h. All non-spring return actuators shall have an external manual gear release to allow manual positioning of the damper when the actuator is not powered. Spring return actuators with more than 60 in-lb torque shall have a manual crank for this purpose.

i. All modulating actuators shall have an external, built-in switch to allow the reversing of direction of rotation.

j. Actuators shall be provided with a conduit fitting and a minimum three-foot electrical cable and shall be pre-wired to eliminate the necessity of opening the actuator housing to make electrical connections.

k. Actuators shall be Underwriters Laboratories Standard 873 listed and Canadian Standards Association Class 4813 02 certified as meeting correct safety requirements and recognized industry standards.

(l) Actuators shall be designed for a minimum of 60,000 full stroke cycles at the actuator's rated torque and shall have a 2-year manufacturer's warranty, starting from the date of installation. Manufacturer shall be ISO9001 certified. Actuators shall be manufactured by Delta Controls Corporation or equal.

2.4.2 Positive Positioners

Positive positioners are required for pneumatic actuators. Each positive positioner shall be a pneumatic relay with a mechanical feedback mechanism and an adjustable operating range and starting point.

2.5 AUTOMATIC CONTROL VALVES

Valves shall have stainless-steel stems and stuffing boxes with extended necks to clear the piping insulation. Unless otherwise stated, valves shall have globe style bodies. Valve bodies shall be designed for not less than 125 psig working pressure or 150 percent of the system operating pressure, whichever is greater. Valve leakage rating shall be 0.01 percent of rated Cv. Unless otherwise specified, bodies for valves 1-1/2 inches and smaller shall be brass or bronze, with threaded or union ends; bodies for 2 inch valves shall have threaded ends; and bodies for valves 2 to 3 inches shall be of brass, bronze or iron. Bodies for valves 2-1/2 inches and larger shall be provided with flanged-end connections. Valve Cv shall be within 100 to 125 percent of the calculated Cv .

2.5.1 Butterfly Valve Assembly

Butterfly valves shall be threaded lug type suitable for dead-end service and modulation to the fully-closed position, with carbon-steel bodies and noncorrosive discs, stainless steel shafts supported by bearings, and EPDM seats suitable for temperatures from minus 20 to plus 250 degrees F. Valves shall have a manual means of operation independent of the actuator. The rated Cv for butterfly valves shall be the value of Cv at 70% open (60 degrees open).

2.5.2 Two-Way Valves

Two-way modulating valves shall have equal-percentage characteristics.

2.5.3 Three-Way Valves

Three-way valves shall provide linear flow control with constant total flow

throughout full plug travel.

2.5.4 Not Used

2.5.5 Valves for Chilled-Water, and Glycol Service

Internal valve trim shall be bronze except that valve stems may be type 316 stainless steel. Valve Cv shall be within 100 to 125 percent of the calculated Cv. Valves 4 inches and larger shall be butterfly.

2.6 Valves for Hot-Water Temperature Service

For hot water service below 250 degrees F internal trim (including seats, seat rings, modulating plugs, and springs) of valves controlling water hotter than 210 degrees F shall be Type 316 stainless steel. Internal trim for valves controlling water 210 degrees F or less shall be brass or bronze. Nonmetallic parts of hot-water control valves shall be suitable for a minimum continuous operating temperature of 250 degrees F or 50 degrees F above the system design temperature, whichever is higher. Valves 4 inches and larger shall be butterfly valves.

2.7 HTHW CONTROL VALVES

HTW control valves shall be two-way pattern of the proportioning type as indicated for the sequence specified. Valves bodies shall be rated for not less than 300 psig. Valves shall be tight closing type. Valve actuator for HTW shall be NC with proportional operator and adjustable stroke. Ambient temperature range is -25-150 degrees F. Body shall carbon steel, globe type and flanged end. Packing shall be Teflon-impregnated asbestos. Valve trim shall be Type 316 stainless steel. Valve shall have close-off rating for pressure and temperature of 300-400 psig, inlet and 250 degrees F, 400 psig for return side. Each valve for proportioning service shall have a contoured plug with equal percentage characteristics and a range ability of 50:1, minimum. Each valve shall be provided with valve-stem travel indicator or means of indicating position of the plug.

2.8 INSTRUMENTATION

2.8.1 Measurements

Transmitters shall be calibrated to provide the following measurements, over the indicated ranges, for an output of 4 to 20 mAdc:

a. Temperature Sensors.

Sensors shall be of the type and have accuracy ratings as indicated and/or required for the application and shall permit accuracy rating of within 1% of the temperature range of their intended use.

OA temperature sensors shall have a minimum range of -52°F to 152°F and an accuracy of within +1°F in this temperature range.

Chilled water and condenser water sensors shall have an accuracy of +0.36°F in their range of application.

Hot water sensors shall have an accuracy of +0.75 degrees F over the range of their application

2.8.2 Temperature Instruments

2.8.2.1 Resistance Temperature Detectors (RTD)

Temperature sensors shall be 100 ohms 3- or 4-wire RTD. Each RTD shall be platinum with a tolerance of plus or minus 0.1 percent at 32 degrees F, and shall be encapsulated in epoxy, series 300 stainless steel, anodized aluminum, or copper. Each RTD shall be furnished with an RTD transmitter as specified, integrally mounted unless otherwise shown.

2.8.2.2 Continuous Averaging RTD

Continuous averaging RTDs shall have a tolerance of plus or minus 1.0 degree F at the reference temperature, and shall be of sufficient length to ensure that the resistance represents an average over the cross section in which it is installed. The sensing element shall have a bendable copper sheath. Each averaging RTD shall be furnished with an RTD transmitter to match the resistance range of the averaging RTD.

2.8.2.3 RTD Transmitter

The RTD transmitter shall match the resistance range of the RTD. The transmitter shall be a two-wire, loop powered device. The transmitter shall produce a linear 4-to-20 mAdc output corresponding to the required temperature measurement. The output error shall not exceed 0.1 percent of the calibrated measurement.

2.8.3 Not Used

2.8.4 Electronic Airflow Measurement Stations and Transmitters

2.8.4.1 Stations

Each station shall consist of an array of velocity sensing elements and an air-flow straightener. Air-flow straightener shall be contained in a flanged sheet metal or aluminum casing. The velocity sensing elements shall be of the RTD or thermistor type, producing a temperature compensated output. The sensing elements shall be distributed across the duct cross section in the quantity and pattern specified by the published application data of the station manufacturer. The resistance to air flow through the airflow measurement station shall not exceed 0.08 inch water gauge at an airflow of 2,000 fpm. Station construction shall be suitable for operation at airflows of up to 5,000 fpm over a temperature range of 40 to 120 degrees F, and accuracy shall be plus or minus three percent over a range of 125 to 2,500 fpm. In outside air measurement or in low-temperature air delivery applications, the station shall be certified by the manufacturer to be accurate as specified over a temperature range of minus 20 to plus 120 degrees F. In outside air measurement applications, the air flow straightener shall be constructed of 1/8 inch aluminum honeycomb and the depth of the straightener shall not be less than 1.5 inches.

2.8.4.2 Transmitters

Each transmitter shall produce a linear, 4-to-20 mAdc, output corresponding to the required velocity pressure measurement. The transmitter shall be a two-wire, loop powered device. The output error of the transmitter shall not exceed 0.5 percent of the calibrated measurement.

2.8.5 Pitot Tube Airflow Measurement Stations and Transmitters

2.8.5.1 Stations

Each station shall contain an array of velocity sensing elements and straightening vanes inside a flanged sheet metal casing. The velocity sensing elements shall be of the multiple pitot tube type with averaging manifolds. The sensing elements shall be distributed across the duct cross section in the quantity and pattern specified by the published installation instructions of the station manufacturer. The resistance to air flow through the airflow measurement station shall not exceed 0.08 inch water gauge at an airflow of 2,000 fpm. Station construction shall be suitable for operation at airflows of up to 5,000 fpm over a temperature range of 40 to 120 degrees F, and accuracy shall be plus or minus three percent over a range of 500 to 2,500 fpm. This device will not be used if the required velocity measurement is below 700 fpm or for outside airflow measurements.

2.8.5.2 Transmitters

Each transmitter shall produce a linear 4-to-20 mAdc output corresponding to the required velocity pressure measurement. Each transmitter shall have a low range differential pressure sensing element. The transmitter shall be a two-wire, loop powered device. Sensing element accuracy shall be plus or minus one percent of full scale, and overall transmitter accuracy shall be plus or minus 0.25 percent of the calibrated measurement.

2.8.6 Differential Pressure Instruments

The instrument shall be a pressure transmitter with an integral sensing element. The instrument over pressure rating shall be 300 percent of the operating pressure. The sensor/transmitter assembly accuracy shall be plus or minus two percent of full scale. The transmitter shall be a two-wire, loop-powered device. The transmitter shall produce a linear 4-to-20 mAdc output corresponding to the required pressure measurement.

2.8.7 Thermowells

Thermowells shall be Series 300 stainless steel with threaded brass plug and chain, 2 inch lagging neck and extension type well. Inside diameter and insertion length shall be as required for the application.

2.9 THERMOSTATS

Thermostat ranges shall be selected so that the setpoint is adjustable without tools between plus or minus 10 degrees F of the setpoint shown. Thermostats shall be electronic or electric.

2.10 PRESSURE SWITCHES AND SOLENOID VALVES

2.10.1 Pressure Switches

Each switch shall have an adjustable setpoint with visible setpoint scale. Range shall be as shown. Differential adjustment shall span 20 to 40 percent of the range of the device.

2.10.2 Differential-Pressure Switches

Each switch shall be an adjustable diaphragm-operated device with two SPDT contacts, with taps for sensing lines to be connected to duct pressure fittings designed to sense air pressure. These fittings shall be of the

angled-tip type with tips pointing into the air stream. The setpoint shall not be in the upper or lower quarters of the range and the range shall not be more than three times the setpoint. Differential shall be a maximum of 0.15 inch water gauge at the low end of the range and 0.35 inch water gauge at the high end of the range.

2.11 INDICATING DEVICES

2.11.1 Thermometers

2.11.1.1 Piping System Thermometers

Piping system thermometers shall have brass, malleable iron or aluminum alloy case and frame, clear protective face, permanently stabilized glass tube with indicating-fluid column, white face, black numbers, and a 9 inch scale. Thermometers for piping systems shall have rigid stems with straight, angular, or inclined pattern.

2.11.1.2 Piping System Thermometer Stems

Thermometer stems shall have expansion heads as required to prevent breakage at extreme temperatures. On rigid-stem thermometers, the space between bulb and stem shall be filled with a heat-transfer medium.

2.11.1.3 Nonaveraging Air-Duct Thermometers

Air-duct thermometers shall have perforated stem guards and 45-degree adjustable duct flanges with locking mechanism.

2.11.2 Pressure Gauges

Gauges shall be 2 inch (nominal) size, back connected, suitable for field or panel mounting as required, shall have black legend on white background, and shall have a pointer traveling through a 270-degree arc. Accuracy shall be plus or minus three percent of scale range. Gauges shall meet requirements of ASME B40.1.

2.11.2.1 Pneumatic Actuator Gauges

Gauges for indicating signal output to pneumatic actuators shall have an outer scale of 3 to 15 psig in 1 psig graduations.

2.11.2.2 Not Used

2.11.2.3 Hydronic System Gauges

Gauges for hydronic system applications shall have ranges and graduations as shown.

2.11.3 Low Differential Pressure Gauges

Gauges for low differential pressure measurements shall be a minimum of 3.5 inch (nominal) size with two sets of pressure taps, and shall have a diaphragm-actuated pointer, white dial with black figures, and pointer zero adjustment. Gauges shall have ranges and graduations as shown. Accuracy shall be plus or minus two percent of scale range.

2.12 CONTROL DEVICES AND ACCESSORIES

2.12.1 Relays

Control relay contacts shall have utilization category and ratings selected for the application, with a minimum of two sets of contacts (two normally open, two normally closed) enclosed in a dustproof enclosure. Relays shall be rated for a minimum life of one million operations. Operating time shall be 20 milliseconds or less. Relays shall be equipped with coil transient suppression devices to limit transients to 150 percent of rated coil voltage. Time delay relays shall be 2PDT with eight-pin connectors, dust cover, and a matching rail-mounted socket. Adjustable timing range shall be 0 to 5 minutes. Power consumption shall not be greater than three watts.

2.12.2 Not Used

2.12.3 Not Used

2.12.4 Not Used

2.12.5 Not Used

2.12.6 Current Sensing Relays

Current sensing relays shall provide a normally-open contact rated at a minimum of 50 volts peak and 1/2 ampere or 25 VA, noninductive. There shall be a single hole for passage of current carrying conductors. The devices shall be sized for operation at 50 percent rated current based on the connected load. Voltage isolation shall be a minimum of 600 volts.

2.13 NOT USED

2.14 CENTRAL HARDWARE

The system specified in this document is an extension of the existing Native BACnet or equal DDC control system.

2.14 BUILDING SYSTEMS INTEGRATION

All indicated equipment, and other Building Automation Control Systems, shall be required to have the ability to interface with the Native BACnet automation subsystem integration package called CONNECT. This package establishes seamless interconnection with third party electrical and mechanical building systems and other manufacturers Building Automation Systems (BAS). These subsystems and BAS systems shall be controlled and monitored through the existing Delta Controls system and shall be graphically programmed with Native BACnet programming package.

A. All desired system information to or from the indicated mechanical and electrical equipment shall be available to the Native BACnet system. The capability to interface with any desired point in the equipment control system shall be available to the Native BACnet system. No limits shall be placed by the manufacturer on the owner or Native BACnet with regard to the access of, or the transmission of, or what may be done with the data provided from the equipment control system.

B. Full cooperation by the equipment manufacturer in this Open Protocol effort shall be a requirement for bidding this project. No exceptions shall be allowed to this requirement, and no bid shall be accepted which does not define clearly and exactly how the proposed equipment will comply with this section.

C. If the equipment manufacturer does not have this capability, they shall contact the authorized Dealer involved for assistance and shall include in their equipment price any necessary equipment obtained from Delta Controls or equal to comply with this section.

D. Other BAS equipment suppliers shall provide this seamless integration through the use of a BACnet Portal as specified below:

(1) The Portal shall be a microprocessor-based communication device designed to provide seamless, two-way translation between two or more standard or non-standard protocols.

(2) The Portal shall be available for a variety of Data Link\Physical Layer configurations including PTP (point-to-point) via EIA-232, MS/TP via EIA-485, ARCNET over EIA-485, LonTalk, and EtherNet using the IEEE 802.2 standard approved for BACnet.

(3) In addition to BACnet (conformance class 4) the Portal shall also support other protocols including LONworks, SNMP, Modbus, J-Bus, Profibus, Batibus, CAB, and Fieldbus.

(4) The Portal shall have at least three communication ports. One shall be for communication between Native BACnet controllers. This network shall be EIA-485 running at 156 kbps using ARCNET. The other two communication ports shall have the ability to be configured for different protocols. One of these shall consist of a terminal board connector which is jumper selectable for EIA-232, 2-wire EIA-485, or 4-wire EIA-485. The other port shall consist of an EIA-232, 9-pin connector. Both ports shall be software selectable for up to 38.4k baud

(5) The Portal shall provide full custom programmability of the data flowing between the networks using the same graphical programming as specified in this specification. The system shall have the ability to create custom building control strategies using global data between networks.

2.15 PORTABLE OPERATOR TERMINAL

Portable Terminal. Provisions are not required for this project.

2.16 Not Used

2.17 FIELD HARDWARE

Field hardware must be of a modular design to ensure reliability and system performance.

A. Local Area Network Gateway - LANgate

(1) The LANgate shall be a microprocessor-based communications device which acts as a gateway between a Controller Network and a Local Area Network (LAN).

(2) Each LANgate shall support a controller network on which may reside any combination of up to 100 control modules. Control Modules shall be Multiple Function Blocks with Expanders (MX-Line), Single Equipment Controllers (S-Line), or Unitary Controllers (U-Line).

(3) The controller network shall use BACnet as its native communication

protocol. The communication between Control Modules shall be ARCNET at 156 kbps implemented over an EIA-485 unshielded twisted pair at the Data Link Layer.

(4) The LAN which interconnects LANgates may be configured as EIA-485 (38.4 kbps), EtherNet (10 Mbps), Token Ring (16 Mbps), or FDDI (100 Mbps), all of which may be implemented over fiber optic, twisted pair, or coaxial cable.

(5) The LANgate shall provide two EIA-232 ports which can be connected to Operator Workstations, portable computers, or modems.

(6) LANgate shall provide full arbitration between multiple users, whether they are communicating through the same or different LANgates.

(7) The LANgate shall be responsible for routing global information from the various controller networks which may be installed throughout a building.

(8) Up to a total of 255 LANgates can be added to the LAN, each supporting up to 100 controllers (total capacity exceeds 2,000,000 points per LAN).

B. Local Area Network Gateway Rack Mounted- EtherNet(LGRM-E)

Shall be located in the buildings Communication Equipment room unless otherwise directed.

(1) The LGRM-E shall be a microprocessor-based communications device which acts as a gateway between a controller network and a Local Area Network (LAN).

(2) Each LANgate shall support a controller network on which may reside any combination of up to 100 control modules. Control Modules shall be Multiple Function Blocks with Expanders (MX-Line), Single Equipment Controllers (S-Line), or Unitary/Terminal Controllers (U-Line).

(3) Not Used.

(4) The controller network shall use BACnet as its native communication protocol. The communication between Control Modules shall be ARCNET at 156 kbps implemented over an unshielded twisted pair. at the Data Link Layer.

(5) The LGRM-E shall configure as EtherNet 10Base-T(10 Mbps) which may be implemented over unshielded twisted pair.

(6) The LGRM-E shall provide two EIA-232 ports which can be connected to Operator Workstations, portable computers, or modems.

(7) LGRM-E shall provide full arbitration between multiple users, whether they are communicating through the same or different LGRM-E.

(8) The LGRM-E shall be responsible for routing global information from the various controller networks which may be installed throughout a building.

(9) Up to a total of 255 LANgates can be added to the LAN, each supporting up to 100 controllers (total capacity exceeds 2,000,000 points per LAN).

C. Gateway Communication Module - LGC

(1) The LGC is a microprocessor-based communication device which provides communication between the Operator Workstation and/or modem with the controller network.

(2) The LGC communicates with the Operator Workstation using an EIA-232 serial communication port.

(3) A second EIA-232 port allows the LGC to communicate with another Operator Workstation or a portable field computer either through a modem or

through a direct EIA-232 connection. The LGC also has a modem reset relay which is activated when the modem fails to respond to the LGC's command.

(4) Each EIA-232 port is switch selectable for up to 38.4 kbps

(5) Each LGC shall support a controller network on which may reside any combination of up to 100 control modules. Control Modules shall be Multiple Function Blocks with Expanders (MX-Line), System Controllers (S-Line), or Unitary Controllers (U-Line).

(6) Not Used.

(7) The controller network shall use BACnet as its native communication protocol. The communication between Control Modules shall be ARCNET at 156 kbps implemented over an unshielded twisted pair. at the Data Link Layer.

D. General Purpose Control Modules - MX-Line, M-Line, X-Line.

(1) The General Purpose Control Modules must use BACnet as the native communication protocol (no "gateways", translators, etc.) between controllers and must, as a minimum, be Conformance Class 3 and support the following Objects;

Binary Input
Binary Output
Binary Value
Analog Input
Analog Output
Analog Value

(2) Each control module must be capable of stand-alone direct digital operation utilizing its own 32 bit processor, non-volatile flash memory, input/output, 12 bit A to D conversion, clock/calendar and voltage transient and lightning protection devices. All non-volatile flash memory shall have a battery backup of at least five years. Firmware revisions to the module should be able to be made from the local workstation, portable operator terminals or from remote locations over modems or LAN's.

(3) The Multi-Purpose Control Modules (MX-Line) shall consist of several modules which provides different I/O point combinations. Additionally each MX-Line Control Module shall be able to connect through its expansion bus to up to five I/O Expander Boards (X-Line). These X-Line boards can expand the total point capacity of each M-Line Control Module up to 192 points.

(4) All point data, algorithms, and application software within a control module shall be custom programmable from the Operator Workstation.

(5) Each Control Module shall execute application programs, calculations, and commands via a 32 bit microcomputer resident in the Control module. The database and all application programs for each Control Module shall be stored in read/writable non-volatile flash memory within the Control Module and will be able to upload/download to/from the Operator Workstation.

(6) Each Control Module shall be connected to a BACnet controller network communicating to/from other Control Modules. Each Control module shall include self-test diagnostics which allow the Control module to automatically relay to the network controller any malfunctions or alarm conditions that exceed desired parameters as determined by programming input.

(7) Each Control module shall contain both software and hardware to perform full DDC/PID control loops.

(8) Each module shall contain an asynchronous serial port for the interface of maintenance personnel's portable computer. All network interrogation shall be possible through this port.

(9) Input-Output Processing

a. Digital outputs. Outputs shall be 24VAC or VDC maximum relay, 3 amp maximum current. Each configurable as normally open or normally closed, and either dry contact or bussed. Each output shall have a manual hand off or auto switch to allow for override and an LED to indicate the operating mode of the output.

b. Universal inputs. Thermistor - 10K Ohm at 77o F, 0-5VDC - 10K Ohm maximum source impedance, 0-20mA - 24 VDC loop power 250 Ohm input impedance, Dry Contact - 0.5mA maximum current.

c. Analog output electronics, voltage mode, 0-10VDC current mode (4-20mA).

d. Analog output pneumatic, 0-20psi. Each pneumatic output shall have a feedback valve to be used in the system for any software programming needs.

The feedback valve shall be the actual psi output value and not a calculated value. Each output shall have a manual override switch which will allow each output to be configured in one of three ways: open, closed, or automatic operation. An LED shall indicate the state of each output.

E. Single Equipment Control Module - S-Line

(1) The Single Equipment Control Modules must use BACnet as the native communication protocol between controllers and must, as a minimum, be Conformance Class 4 and support the following Objects;

Binary Input
Binary Output
Binary Value
Analog Input
Analog Output
Analog Value

(2) The control module must be capable of stand-alone direct digital operation utilizing its own 32 bit processor, non-volatile flash memory, input/output, 10 bit A to D conversion, clock/calendar and voltage transient and lightning protection devices. All non-volatile flash memory shall have a battery backup of at least five years. Firmware revisions to the module should be able to be made from the local workstation, portable operator terminals or from remote locations over modems or LAN's.

(3) All point data, algorithms, and application software within a local network shall be custom programmable from the Operator Workstation.

(4) Each Control Module shall execute application programs, calculations, and commands via a 32 bit microcomputer resident in the Control module. All operating parameters for each Control Module shall be stored in non-volatile flash memory within the Control Module and will be able to upload/download parameters to/from the Operator Workstation.

(5) Each Control Module shall be connected to a BACnet controller network communicating to/from other Control Modules and gateway. Each Control module shall include self-test diagnostics which allow the Control module to automatically relay to the network controller any malfunctions or alarm conditions that exceed desired parameters as determined by programming input.

(6) Each Control module shall contain both software and hardware to perform full DDC/PID control loops.

(7) An asynchronous serial port shall be provided for the interface of maintenance personnel's portable computer. All network interrogation shall be possible through this port.

(8) The S-Line Control Module shall be capable of being mounted directly in or on AHU equipment.

(9) The S-Line AHU Controller shall be capable of proper operation in an ambient temperature environment of -200F to +1500F.

(10) Input-Output Processing

a. Digital outputs. Outputs shall be 24VAC or VDC maximum relays, 3 amp maximum current. Each configurable as normally open or normally closed, and either dry contact or bussed. Each output shall have a manual hand off or auto switch to allow for override and an LED to indicate the operating mode of the output.

b. Universal inputs. Thermistor - 10K Ohm at 77o F, 0-5VDC - 10K Ohm maximum source impedance, 0-20mA - 24 VDC loop power 250 Ohm input impedance, Dry Contact - 0.5mA maximum current.

c. Analog output electronics, voltage mode, 0-10VDC current mode (4-20mA).

d. Enhanced Zone Sensor Input. The input shall provide one thermistor input, one local setpoint adjustment, one timed local override switch, and an occupancy LED indicator.

G. Unitary Control Modules -U-Line

UNI

(1) Each U-Line controller shall communicate with the controller network through the Unet Interface Module (UNI). The UNI shall provide one EIA-485 port for a controller network connection and one EIA-485 port for the Unet connection. In addition, a direct connect EIA-485 port shall also be provided for connection of a portable operator's computer.

(2) The Unet Interface Modules shall use BACnet as the native communication protocol between controllers on the controller network and must, as a minimum, be Conformance Class 4 and support the following Objects;

Binary Input
Binary Output
Binary Value
Analog Input
Analog Output
Analog Value

(3) The UNI shall utilize the Optomux open protocol for communication to the U-Line controllers. The communication speed between U-Line controllers shall be at least 38.4 kbps.

(4) An asynchronous serial port shall be provided on the UNI for the interface of maintenance personnel's portable computer. All network interrogation shall be possible through this port.

(5) Each UNI shall execute application programs, calculations, and

commands via a 32 bit microcomputer resident in the UNI. All operating parameters for each U-Line shall be stored in read/writable non-volatile flash memory within the UNI. All non-volatile memory shall have a battery backup of at least five years. Firmware revisions to the module should be able to be made from the local workstation, portable operator terminals or from remote locations over modems or LAN's.

(6) The UNI shall contain both software and hardware to perform full DDC/PID control loops. The U-Line controller shall be able to provide normal binary type output.

(7) Each UNI circuits shall be optically isolated.

U-Line

(8) U Line controllers shall be capable of providing the Direct Digital Control of single zone terminal HVAC units; Variable Air Volume Terminal Box, Fan Coil Units, Water Source Heat Pump Units, Unit Ventilators, etc.

(9) Each U-Line shall be able to support various type of zone temperature sensors, such as: temperature sensor only, temperature sensor with built-in local override switch, with setpoint adjustment switch.

(10) Each U-Line for VAV application shall have a built-in air flow transducer for accurate air flow measurement in order to provide the Pressure Independent VAV operation.

(11) Each U-Line controller for VAV applications shall have an integral direct coupled electronic actuator. The actuator shall provide on-off/floating point control with a minimum of 35 in-lb of torque. The assembly shall mount directly to the damper operating shaft with a universal V-Bolt clamp assembly. The actuator shall not require any limit switches, and should be electronically protected against overload. When reaching the damper or actuator end position, the actuator shall automatically stop. The gears shall be manually disengaged with a button on the assembly cover. The position of the actuator shall be indicated by a visual pointer. The assembly shall have an anti-rotational strap supplied with the assembly that will prevent lateral movement.

(12) Each U-Line and UNI shall have LED indication for visual status of communication, power, and all outputs.

(13) In the event of a loss of communication with the UNI, each U-Line controller shall control from stand alone algorithm which maintains the assigned space temperature until communication with the UNI is restored.

(14) Input/Output Processing

a. Digital outputs. Outputs shall be 24VAC or VDC maximum relays, 3 amp maximum current. Each configurable as normally open or normally closed, and either dry contact or bussed.

b. Universal inputs. Thermistor, dry contacts or 0-5VDC with 0-100K Ohm input impedance.

c. Enhanced Zone Sensor Input. The input shall provide one thermistor input, one local setpoint adjustment, one timed local override switch, and an occupancy LED indicator.

d. Analog output electronic, voltage mode 0-10VDC, current mode (4-20mA).

I. Field Testing and Programming Equipment

A portable laptop or notebook computer shall interface via standard push-in connection at an asynchronous serial port located at the Control modules and at selected enhanced zone temperature sensors as indicated on project plans. This portable unit shall be capable of full global communications with all Control modules connected within the respective network and shall provide functionally identical user interface to the Workstation, in non-graphic format. Units shall be able to interrogate all points and alter all programming.

2.18 BTU MONITORING SYSTEM EQUIPMENT

Primary flow measuring element shall be an in-line, vortex shedding type meter. The exact location and arrangement of pipe, upstream and downstream of the flow meter shall be based on the manufacturer's published recommendations, requirements, and specifications. The flow meter shall be identified by a stainless steel tag indicating manufacturer, serial number, K-factor and maximum output. Flow meter shall be equivalent in design and capability to the EMCO Model Vortex PhD series.

Field wiring for each sensor device shall be three conductor sized in accordance with Section: ELECTRICAL WORK, INTERIOR, solid copper, 300 volt, thermo-plastic twisted shielded instrumentation cable in conduit. All wires shall be terminated with pressure type connectors suitable for wire size and material as well as terminal connection.

a. Vortex Shedding Type Meters

Meter shall be factory wet flow calibrated. Calibration information shall be supplied with each meter. Meter accuracy shall be +/- 0.15% of flow rate. Meter shall be available for line sizes from 1 to 4 inches. Meter wing and shedder bar shall be constructed of stainless steel. Meter shall have a completely sealed body cavity tested per ASME/ANSI B16.34. Meter shall have an operating temperature range of -40 to 750 degrees F.. Meter shall have a process pressure rating of ANSI Class 150#. Meter shall operate linearly within Reynolds numbers of 20,000 to 7,000,000.

(1) Meter shall use dual piezoelectric sensor for noise rejection. Sensor shall be removable without process shutdown or the requirement of bypass piping. Sensor shall be removable at process pressures of up to 750 psig.

(2) Electronics shall be suitable for integral or remote type mounting. Electronics shall be equivalent in design and capability to EMCO's "EZ Logic" which enables the user to configure, diagnose and personalize each meter via a four-button keypad or magnet Wand without removing cover, flow rate and total shall be displayed in engineering units. Electronics enclosure shall be NEMA 4 type. Meter shall have digital noise filter. Meter shall have analog 4-20 mA output, voltage pulse output and open collector FET output.

(3) Temperature sensors shall be of the RTD type and shall be provided with 316 stainless steel wells with insertion length appropriate for the pipe size used. Sensor shall be provided with cast aluminum junction box for wiring terminations. Sensors shall be Model TEM-30 as manufactured by EMCO or equal.

b. Sensor Selection

(1) Select flow sensor to provide the accuracy stated for the output range from peak flow of 21.6 GP< to one-fourth of the peak flow.

(2) The RTD transmitters shall be selected to match the resistance range of the RTD. The transmitter shall produce a linear 4 to 20 maDC output corresponding to the required temperature span. One delta-T transmitter may be provided with a 4 to 20 maDC output for the delta-T temperature span of 0 to 50-degrees F.. The output error shall not exceed 0.1 percent of calibrated span. The trans-mitter shall include offset and span adjustments unless the RTD element is integral to the transmitter and system calibration is provided.

c. BTU COMPUTER (ie. Flow Processor)

The flow processor shall contain software capable of computing volumetric flow (actual or standard), mass flow and BTU usage for liquid. Processor must have 2 resettable and 2 no-resettable totalizer for user selected values. Processor shall have continuous diagnostics and displayed fault messages and shall be capable of accepting an 8-point flow calibration for linearization values (ave., min., max.) for all flow variables, and temperatures. Processor equipped with a 2-line x 16 character, alpha-numeric, LCD backlit display. Display shall illustrate flow values and engineering units on same screen. Display shall have both automatic or manual scanning of chosen flow values. Flow processor shall operate on 115 Vac, and shall produce the following outputs:

Power: 24 Vdc +/- 5% at 15 mA

Analog: isolated 4-20 mA dc

Relay: isolated solid state with AC or DC option

Flow processor shall have an operating temperature range of 32 to 122 degrees F.. Flow processor shall be provided in a NEMA 4 enclosure. Flow processor shall be equivalent in design and capability to the EMCO Model FP-93.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION CRITERIA

3.1.1 HVAC Control System

The HVAC control system shall be completely installed and ready for operation. Dielectric isolation shall be provided where dissimilar metals are used for connection and support. Penetrations through and mounting holes in the building exterior shall be made watertight. The HVAC control system installation shall provide clearance for control system maintenance by maintaining access space between coils, access space to mixed-air plenums, and other access space required to calibrate, remove, repair, or replace control system devices. The control system installation shall not interfere with the clearance requirements for mechanical and electrical system maintenance.

3.1.2 Not Used

3.1.3 Device Mounting Criteria

Devices mounted in or on piping or ductwork, on building surfaces, in mechanical/electrical spaces, or in occupied space ceilings shall be

installed in accordance with manufacturer's recommendations . Control devices to be installed in piping and ductwork shall be provided with required gaskets, flanges, thermal compounds, insulation, piping, fittings, and manual valves for shutoff, equalization, purging, and calibration. Strap-on temperature sensing elements shall not be used except as specified.

3.1.4 Wiring Criteria

Wiring external to control panels, including low-voltage wiring, shall be installed in metallic raceways. Nonmetallic-sheathed cables or metallic-armored cables may be installed in areas permitted by NFPA 70. Wiring shall be installed without splices between control devices and DDC panels. Instrumentation grounding shall be installed as necessary to prevent ground loops, noise, and surges from adversely affecting operation of the system. Ground rods installed by the contractor shall be tested as specified in IEEE Std 142. Cables and conductor wires shall be tagged at both ends, with the identifier shown on the shop drawings. Electrical work shall be as specified in Section 16415 ELECTRICAL WORK, INTERIOR and as shown.

3.2 CONTROL SYSTEM INSTALLATION

3.2.1 Damper Actuators

Actuators shall not be mounted in the air stream. Multiple actuators operating a common damper shall be connected to a common drive shaft. Actuators shall be installed so that their action shall seal the damper to the extent required to maintain leakage at or below the specified rate and shall move the blades smoothly.

3.2.2 Not Used

3.2.3 Room Instrument Mounting

Room instruments shall be mounted so that their sensing elements are 5 feet above the finished floor unless otherwise shown. Temperature setpoint device shall be recess mounted.

3.2.4 Freezestats

For each 20 square feet of coil face area, or fraction thereof, a freezestat shall be provided to sense the temperature at the location shown. Manual reset freezestats shall be installed in approved, accessible locations where they can be reset easily. The freezestat sensing element shall be installed in a serpentine pattern.

3.2.5 Averaging Temperature Sensing Elements

Sensing elements shall have a total element minimum length equal to 1 linear foot per square foot of duct cross-sectional area. Sensing elements shall have a total element minimum length equal to 1 linear foot per square foot of duct cross-sectional area.

3.2.6 Not Used

3.2.7 Not Used

3.2.8 Not Used

3.2.9 Indication Devices Installed in Piping and Liquid Systems

Gauges in piping systems subject to pulsation shall have snubbers. Thermometers and temperature sensing elements installed in liquid systems shall be installed in thermowells.

3.2.10 Not Used

3.3 CONTROL SEQUENCE OF OPERATION

Shall be as shown and as indicated on drawing.

3.4 SOFTWARE

GENERAL

A. The Contractor shall provide all software required for efficient operation of all the functions required by this specification. Software shall be modular in design for flexibility in expansion or revision of the system.

The software shall, as a minimum, include:

- (1) Complete database entry
- (2) Configuration of all application programs to provide the sequence of operation indicated
- (3) Graphics of each system as shown on the I/O Summary Tables
- (4) Alarm limits and alarm messages for all critical and non-critical alarms
- (5) Configuration of all reports and point summaries indicated

B. The software shall be provided in these five categories:

- (1) System executive software
- (2) Software for user control over system configuration at the CS location
- (3) Facility monitoring functions
- (4) Direct digital control
- (5) Application software

C. The system shall support Windows Dynamic Data Exchange (DDE).

The system shall allow any DDE or Net DDE compatible program to dynamically access status and parameter information within the SuperVision Program.

D. The system shall be fully Graphically Programmed.

The system shall include the ability for an operator to create his own Graphic Programming. This is a method by which a system programmer is allowed to create a sequence of operation by assembling graphic Microblocks that represent each of the commands necessary to complete a sequence. Microblocks represent common logical control devices used in conventional control systems, such as relays, switches, high signal selectors, etc., in addition to the more complex DDC and energy management strategies such as PID loops and optimum start. Each Microblock shall be interactive and contain the programming necessary to execute the function of the device it

represents.

Graphic Programming shall be performed while on screen and using a mouse; each Microblock shall be selected from a Microblock library and assembled with other Microblocks necessary to complete the specified sequence. Microblocks are then interconnected on screen using graphic "wires", each forming a logical connection. Once assembled, each logical grouping of Microblocks and their interconnecting wires then forms a graphic function block which may be used to control any piece of equipment with a similar point configuration and sequence of operation.

The clarity of the graphic sequence must be such that the user has the ability to verify that system programming meets the specifications, without having to learn or interpret a manufacturer's unique programming language. The graphic programming must be self-documenting and provide the user with an understandable and exact representation of each sequence of operation.

Full simulation capability shall also be provided with the graphic programming. User shall be able to fully simulate the constructed sequence on screen before the sequences are downloaded into the controllers. The System shall also include the ability to simulate multiple graphic programs communicating with each other on a simulated network.

The simulation must show each output value and how it varies in relation to an artificial time clock. The time clock may run at normal time increments, increased increments (fast motion) or decreased increments (slow motion).

The following is a minimum definition of the capabilities of the Graphic Programming software.

Function Block (FB) - Shall be a collection of points, Microblocks and wires which have been connected together for the specific purpose of controlling a piece of HVAC equipment or a single mechanical system.

Logical I/O (LIO's) - Input/Output points which shall interface with the control modules in order to read various signals and /or values or to transmit signal or values to controlled devices.

Microblocks - Shall be software devices which are represented graphically and may be connected together to perform a specified sequence.

Wires - Shall be Graphical elements which are used to form logical connections between Microblocks and between Microblocks and LIOs. Different wires types shall be used depending on whether the signal they conduct is analog or digital.

Labels - Labels shall be similar to wires in that they are used to form logical connections between two points. Labels shall form a connection by reference instead of a visual connection. i.e., two points labeled "A" on a drawing are logically connected even though there is no wire between them.

Parameter - A parameter shall be a value which may be tied to the input of a Microblock. Each parameter will then be displayed on the resulting FB parameter page and can be modified to varying degrees based upon the appropriate password level being used by the operator. Different parameter Microblocks shall be used depending on whether the parameter is digital or analog.

Constant - A constant shall be similar to a parameter except that it is displayed only in the graphic FB file itself and will not be displayed on any parameter page. Certain coefficients which are used in various calculations always remain constant and therefore should be constants which are embedded in the program and not parameters. Different constant Microblocks shall be used depending on whether the constant is digital or analog.

Pop-ups - Pop-ups shall appear after a Microblock has been inserted which has default parameters associated with it. Default parameter pop-ups shall contain various editable and non-editable fields and shall contain "push buttons" for the purpose of selecting default parameter settings.

Icon - An icon shall be graphic representation of a software program. Each graphic Microblock has an icon associated with it which graphically describes its function.

Menu-bar Icon - Shall be an icon which is displayed on the menu bar on the Native BACnet screen which represents its associated graphic Microblock.

3.5 SYSTEM SOFTWARE

A. The workstation shall display graphically, in up to 256 different colors, the following system information:

General area maps shall show locations of controlled buildings in relation to local landmarks.

Floor plan maps shall show heating and cooling zones throughout the buildings in a range of colors which provide a visual display of temperature relative to their respective setpoints. The colors shall be updated dynamically as zones' comfort condition change. Locations of space sensors shall also be shown for each zone. Setpoint adjustment and color band displays shall be provided as specified in specification section 3.05, D. 4 "Setpoints" below.

Mechanical system graphics shall show the type of mechanical system components serving any zone through the use of a pictorial representation of components. It shall also provide a current status of all I/O points being controlled and applicable to each piece of equipment including analog readouts in appropriate engineering units at appropriate locations on the graphic representation.

B. Each category of software shall consist of interactive software modules. Each module shall have an associated priority level and shall execute as determined by the program controller as defined in the real time operating system.

C. The workstation shall allow receipt of alarms and messages while in a functional mode other than energy management, i.e., incoming alarms shall be displayed while the operator is in a word processing, spreadsheet, or other operating mode. The system must automatically switch from a non-energy management mode, respond to an alarm, and return to the exact position left in the previous functional mode.

D. The building operator shall be able to communicate and direct all control functions through the use of a 2-button "mouse" operator interface

to monitor and control all functions and sequences within the system.

The following information shall be selectable from a button menu bar available on the bottom of the various graphics.

Exit	Trends	Help files
Reports	Setpoints	Download
Schedules	Module Status	Upload
Schedule Graphs	Parameters	Print
Utilities	Minimize	Manual commands
Groups	Return to last view	Point Help
	Live Graphic Function Blocks	

Programming, scheduling and setpoint changes shall be accessible for modification on each menu for the associated equipment. Operator shall be able to automatically download changes from the workstation to the appropriate program for the equipment being controlled. Operator shall be able to upload parameters setpoint information and schedules from the field modules to the workstation.

(1) Input Format.

Operators shall be able to control system functions based on their password level. The primary operator interface shall be via a two button mouse.

(2) Operator Commands.

All operator commands shall be in the graphics data base and menu driven. After the operator selects the desired object item or menu, the system shall display either the status of selected object item or the allowable options available. Upon entry of a command to the point or points desired as described above, the system shall, before performing any command, respond with an echo of the request. This echo feedback shall include the command requested and any entered data. System shall include error monitoring software for user's input error.

(3) Output Format.

The system shall operate on a System Format basis, regardless of the manner or hardware configuration in which the data is acquired. A "system" shall consist of a logical grouping of data points, related to a piece of mechanical equipment, an energy distribution system, or an architectural area. For example, in somecases, it may be desired to display, as a single system, a space temperature with its associated air handling unit, and in other cases to display all space temperatures on a floor or in a building. The system shall allow such determinations to be made without regard to the physical hardware locations of a point or group of points. Likewise, the system shall accommodate future changes of system grouping and operations without field hardware changes.

- a. All displays and logs shall contain a header line indicating date, day-of-week, and time.
- b. All output displays or logs of a point or group of points shall contain, as a minimum, the following information:

- (1) Graphic presentation of the System
- (2) User name of point
- (3) Point descriptor
- (4) Current value/status

- (5) Associated engineering units
- (6) Alarm description

c. User names, point descriptors, and engineering units shall be operator definable on a per point basis.

(4) Setpoints

The system shall utilize a contiguous band of colors each corresponding to actual zone temperatures relative to the desired heating and cooling setpoints. The ideal temperature shall be shown as a green color band. This color band corresponds to the dead band between the onset of mechanical heating or cooling. Temperatures slightly warmer than ideal shall be shown in yellow, and even warmer temperature band shall be shown in orange.

Temperatures slightly cooler than ideal shall be light blue, and even cooler temperatures shall be shown as dark blue. All alarm colors shall be in red.

The system shall be capable of utilizing the mouse operator interface device to change individual zone temperature bar and by pressing a button, and by moving the mouse cursor to an increased or decreased temperature setpoint within that zone. The system shall also be capable of utilizing the mouse interface device or a conventional keyboard to change a numeric temperature setpoint value instead of utilizing the graphic temperature bar. The floor plan graphic shall then be able to change colors on a zone by zone basis to reflect the actual temperature in each zone relative to the changed desired heating or cooling setpoint. The system shall be capable of globally changing all setpoints.

(5) Graphic Structure

The intent of the graphics is to ensure the operator is always aware of his position within the system as well as how to logically progress through the graphical hierarchy to select any desired graphic or other source of information. The system software shall provide the operator with the capability of returning to any previous graphic by pointing to a graphic tab then pushing a single button on the mouse operator interface.

The system software must be programmed to provide a separate color graphic for:

- (1) Each piece of equipment monitored or controlled including each terminal unit
- (2) Each building
- (3) Each floor and zone controlled
- (4) Each schedule
- (5) Each trend
- (6) Each report
- (7) Each Graphical Software Program

(6) Passwords

User Access Restriction. Operator sign-on shall require an assignable password. Each operator can be assigned to any one of ten levels of system access.

3.6 USER CONTROL OVER SYSTEM CONFIGURATION

A. Database Creation and Modification. All changes shall be done utilizing standard procedures and be capable of being done while the system is on-line and operational. The system shall allow changes to be made at the local site through a portable computer and at the workstation.

B. The system shall permit the operator to perform as a minimum the following:

- (1) Add and delete points
- (2) Modify point parameters
- (3) Create and modify control sequences and programs
- (4) Reconfigure application programs
- (5) Add and/or modify graphics

C. All data points within the database shall be completely accessible as independent or dependent variables for custom programming, calculation, interlocking, or manipulation.

D. Graphics Software.

The graphics software shall permit the easy construction of infinitely variable shapes and sizes through the use of the mouse pointing device.

A selection of 256 colors and various fill textures, line types and text styles shall all be accessible through the use of the mouse interface. The software shall resemble many of the computer aided design programs currently available and allow graphics to be easily moved, edited, added or deleted.

Graphics software shall be fully implemented and operational to accomplish the following:

- (1) Create a new graphic picture
- (2) Modify a portion of a graphic picture
- (3) Delete a graphic picture, or any portion thereof
- (4) Call up a graphic picture
- (5) Cancel the display of a graphic picture
- (6) Assign conditions which automatically initiate the display
- (7) Overlay alphanumeric and graphics
- (8) Save the graphic picture
- (9) Display latest process data fully integrated with the graphic display
- (10) Display Live Graphical Software Programs

E. The workstation must be able to generate standard ASCII file formats to allow use with third-party software (Lotus 123, etc.) to generate and store owner-designed reports.

3.7 FACILITY MANAGEMENT FUNCTIONS

A. Trend Logging

The system shall be able to trend and display either numerically or graphically any analog or digital physical point or calculated point or any output from any of the Microblocks in the Graphics Programs.

The system shall be able to simultaneously graphically display an unlimited number of trends at once (limited only by the resolution of the viewing

screen) of the most recent two hundred and eighty eight (288) samples. Sample intervals shall be as small as one (1) second. Each trended point will have the ability to be trended at a different trend interval. When multiple points are selected for display which have different trend intervals, the system will automatically scale the axis.

The system shall have the ability to view trends from anywhere within the same controller network simultaneously. Trends shall be picked from a hierarchical tree using the mouse (similar to Windows File Manager).

Trends shall be able to dynamically update at user defined intervals.

It shall be possible to Zoom-in on a particular section of a trend for more detailed examination.

It shall be possible to pick any point on an trend and have it numerical value displayed.

Each module shall be capable of automatically uploading on a daily basis all accumulated trend data to the workstation for permanent storage on hard disk.

B. Trend Historian (TH)

The system operator shall have the ability to set up a continuous trend of any point, as described above, for a limitless period of time.

Any point assigned to the TH will automatically upload to the workstation hard disk the trend information in groups of the most recent 288 samples. This will continue as long as the point is assigned to the TH.

The system operator will be able to simultaneously graphically display any four (4) values being trended by the TH.

The operator will be able to move back in time by clicking with the mouse on a button marked "back", or forward in time by clicking on a button marked "forward". The operator will also have the option of typing in a date in the approximate location which will automatically display the trend information for that time period.

C. Run Time

The system shall provide run time information for all digital output and input points for all modules on command from the operator. Maximum run time limits shall be operator definable and shall be capable of automatically issuing a printed message when the run time maximum is exceeded. The operator shall be able to reset the run time accumulator.

Run time hours and start time date shall be retained in non-volatile module memory.

Each module shall be capable of automatically uploading all accumulated data to the workstation for permanent storage on hard disk.

D -Alarm Event Routing And Tracking Software

The Alarm Management Software (AMS) shall be a comprehensive software package which runs in the Windows environment. It shall provide for creating alarming actions, generating alarm reporting actions, and

configuring alarming views. The AMS software shall provide as a minimum the following features. Any system not meeting these minimum requirements shall be unacceptable.

1. Database Tables

The software shall provide as a minimum five database tables that contain records configurable by the operator. These tables shall be Operators, Systems, Reporting Actions, Groups and Alarms. Each database shall be capable of the following:

a. Operators- The operator table shall contain information on operators who will be using the AMS. Once an operator has been created, and if that operator has acknowledged any alarms, the operator record shall not be able to be erased unless and until all alarms acknowledged by that operator have been deleted from the system database. There shall be no limit to the number of operators that can be added to the system.

Passwords- Each operator must have a password. This password is used to log into the system and may also be required to acknowledge alarms, if the alarm has been so configured. The password shall be up to 8 characters in length.

Level- Each operator shall have a security level assigned. A security level is a number that defines a level of access in the AMS. This security level is also assigned to commands and alarms. An operator must have a security level equal to or greater than a command's security level in order to perform that command. Additionally, an operator must have a security level equal to or greater than an alarm's level in order to acknowledge that alarm or change the status of that alarms Reporting Action. The software shall provide for at least 100 security levels.

b. Systems- The Systems database table shall allow the AMS software to have multiple systems or locations reporting to this one AMS database for alarm routing and management. An example would be, if there were multiple buildings located at multiple sites around the country all these Systems shall be able to be integrated, by this software, into one AMS database (in lieu of separate databases) for the purpose of alarm management routing and reporting.

c. Reporting Actions- A Reporting Action shall be the automatic procedure that is launched (under certain conditions) after an alarm is received by the AMS workstation station. The operator shall have the capability to define when these Reporting Actions will be launched. Reporting Actions shall be associated with alarms through Groups. When the AMS receives an alarm the operator shall have the capability to view the Reporting action status as they are launched and executed. The operator logged in at the receiving station that received the alarm shall have the ability to Abort or Execute the Reporting Action before its scheduled launch time if he/she has the proper security level. The following types of Reporting Actions shall be available:

ASCII File Write- The ASCII File Write Reporting Action (AFWRA) shall enable the operator to append operator-defined alarm information to any alarm through a text file. The alarm information that is written to the file shall be completely definable by the operator. The operator may enter text or attach other data point information (such as AHU discharge temperature and fan condition upon a high room temperature alarm)

Numeric Pager- The Numeric Pager Reporting Action (NPRA) pages personnel by sending numeric messages to personal pagers through the use of a third-party service (definable and subscribed to by the operator). The numeric message may consist of numeric text entered by the operator and/or the Alarm ID and Alarm Priority. The operator shall be able to define how many times to attempt to connect to the pager service. The operator shall also be able to define a secondary number to call in case the connection to the first number is unsuccessful. The entire cycle of calling can be repeated for as many times as the operator defines, or until a successful page is completed. Two different Numeric Pager Reporting Actions may be defined.

Parallel Printer- The Parallel Printer Reporting Action prints alarm information to a parallel printer. Two different Parallel Printer Reporting Actions may be defined.

Serial Output- The Serial Output Reporting Action (SORA) sends alarm information to a Video Display Terminal (VDT). The terminal can be directly connected to the receiving station, or it can be accessed by a modem-to-modem connection. The alarm information is sent to the VDT and displayed on the screen. If previous alarm information has been sent, the new information is displayed starting at the next available line on the screen. The alarm information shall also be able to be sent by a modem-to-modem connection to a remote serial printer.

Alphanumeric Pager- The Alphanumeric Pager Reporting Action (APRA) shall page personnel from the receiving station using an alphanumeric paging system or a third party alphanumeric pager service (definable and subscribed to by the operator). The paging system can be directly connected to the receiving station, or it can be accessed by a modem-to-modem connection. The alphanumeric page that is sent shall be completely configurable by the operator. Up to 30 pagers shall be able to be contacted with a single connection to the paging unit. Only paging systems that use the PET protocol (also called TAP protocol) shall be used.

After an individual reporting action is configured by the operator, the operator shall have the ability to fully test this action within the AMS system. All actions shall be tested without the need for any real point alarms from field panels.

d. Groups- Groups exist as organizers for Reporting Actions. Five different groups shall be available:

- Alarms-Urgent
- Alarms
- Massages
- Status reports
- Trend Reports

After a Group is configured with Reporting Actions, it can be associated with Alarm records when the alarm is configured

e. Alarms- There shall be two different kinds of alarm records in the AMS database:

Alarm Records- An alarm record is alarm information configured by the operator that corresponds to an alarm the AMS expects to receive. Once the AMS receives the alarm, the configured information is used by the AMS to display and handle the alarm.

Instance Record- An Instance record is a log record that is created when an alarm is received. The AMS shall log these alarms in the "instance" database.

All alarm generated at the direct digital controller level shall contain the following information as a minimum:

- (1) Time/Date Stamp as to when the alarm actually occurred
- (2) Building Identification
- (3) Alarm network address location
- (4) Unique assignment code of alarm ID

The AMS system shall be capable of configuring an unlimited number of alarm and/or alarm conditions. For each Alarm the following selections shall be available as a minimum in configuring how the alarm is reported, viewed and routed.

Multiline Text Field- Each alarm shall have a Text field which is a multi-line text. This information can be displayed with an alarm on the Main View of the AMS or sent to a serial output or a printer. The system shall allow the operator to enter regular text in this field (for example, "Boiler #3 has been shut down.") and/or Time, Date and Latched Data Values. Latched Data Values can be any digital or analog information available in the system which may have influenced the activation of that alarm/message. (i.e. a High Discharge Air Temperature alarm may also latch the current status of the Fan, Damper position, CFM, Cooling Valve position and Return Air Temperature). There shall be no limit to the length of the information which can be associated with an alarm.

Group Field- The Group Field shall be used to associate an Alarm record with a Group. Once an alarm is associated with a Group, any Reporting Actions that belong to that Group are launched after the AMS receives the alarm and the launching conditions are fulfilled.

Security Level Field- The Security Level field assigns a numeric level of access to the alarm. An operator must have the same security level as an alarm or higher in order to acknowledge it and to change the alarm's Reporting Actions' status. Security levels can range from 1-100, with "1" being the lowest and "100" being the highest.

(2) Views

The AMS shall provide seven different "Views" in which the different types of alarms are displayed. These views are as follows:

Alarms-Urgent
Alarms
Messages
Status Reports
Trend Reports
Closed
Unacknowledged

The following information shall be displayed for each alarm:

Alarm Type
Date and Time the alarm occurred
Alarm ID

System ID
Site
Alarm address
Tab Labels
Multi-line Alarm Text
Acknowledging Operator

Main View- The Main View shall provide the following as a minimum:

- a. Title Bar located at the top which contains the name of the AMS station.
- b. Menu Bar which shows all the pull-down selections available within the system.
- c. Alarm Display which shows alarms in a format called a "view".

(3) Handling Alarms

As specified before the AMS shall have the capability to display different "Views". These views display alarm information using different formats and filters. The print command can also be used to print the alarm information displayed in the Main View.

- a. Printing Alarms- The print command shall allow the operator to print all the alarms displayed in the Main View. Alarms shall be printed the way that they appear in the Main View.
- b. Not Used.
- c. Alarm Receiving- When an alarm is received it may be configured to require conditions to occur before it can be closed. If no conditions are required the alarm is received and immediately closed. The alarm could be required to go through any or all of the following states before being closed:

- (1) Active-Unacknowledged: An alarm that has not received a RTN message, and has not been acknowledge by the operator.
- (2) Active -Acknowledged: An alarm that has not received a RTN message but has been acknowledged.
- (3) Inactive-Unacknowledged: An alarm that has received a RTN message but has not been acknowledged.
- (4) Inactive-acknowledged: An alarm that has received a RTN message and has been acknowledged.
- (5) Closed: An alarm that has met all of the requirements.

Based on the above state of the alarm, various actions by the operator may be required in order to achieve the next state.

- d. Alarm Conditions- An alarm can be configured with multiple conditions that must be fulfilled before it can reach the Closed state.

An alarm shall be able to be configured to require an Acknowledgment before it can be Closed.

An alarm shall be able to be configured to launch a Reporting Action. This Reporting Action must be completed before the alarm can be Closed.

- e. Alarm Information Pop-Up- Specific information for an alarm can be viewed by double-clicking on the alarm from the Main View. This Pop-Up will display the Multiline Alarm Text associated with this alarm. There shall be no limitation to the length of this message. The text in this window cannot be cut, copied, or altered in any way.

f. Alarm Commands- There shall be several commands available for the operator to use to perform some kind of action. To perform an action on an alarm the operator shall select the alarm from the Main View, then select one of the following commands from the Menu Bar.

Silence- Alarms may require an operator notification if so configured. The operator can halt Notification with the Silence command. Acknowledging an alarm shall automatically silence an alarm.

Acknowledge- The Acknowledge command shall be performed by the operator currently logged in. Unlike the Silence command, the Acknowledge command is specific to an alarm. This command allows the operator to formally recognize individual alarms. Each alarm must be selected and acknowledged individually if it was configured to require acknowledgment. To acknowledge an alarm the operator must have a security level equal to or greater than the alarm. If the operator does not have a high enough security level, the AMS shall display an error message.

Delete- The Delete command allows an operator to delete an instance record from the instance database. When an alarm is deleted, it is removed from the Main View and the database permanently.

View Reporting Status- The View Reporting Status command allows an operator to view detailed information about an alarm's individual Reporting Actions which includes completion status as well as launch information. With this feature, an operator logged in at the receiving station also shall have the ability (given the appropriate security level) to abort and execute Reporting Actions early.

Building Management System- The BMS command shall allow an operator to go directly to the BMS graphic that was responsible for generating a particular alarm.

Acknowledge All in View- The Acknowledge All command shall work in the same manner as the Acknowledge command except that it acknowledges all alarms displayed in the current view. Alarms not displayed if the current view are not acknowledged.

Delete All in View- The Delete All command shall delete all alarms in the current view. If you wish to cancel the Delete All command while it is in progress, select the Cancel button from the Delete All pop-up. The Cancel command will only affect alarms that the AMS has not yet deleted.

Force Return to Normal- The Force RTN command allows the operator to have an alarm return to normal even though the alarm has not received an RTN message from the Module.

E. Reports and Archiving

The field modules shall be capable of calling the workstation during off peak phone rate hours to automatically upload all current and accumulated data. This shall be delivered to the workstation for printing and/or permanent storage on hard disk. The system shall further be capable of transferring hard disk information onto a floppy disk or magnetic tape for remote site storage.

The system shall be capable of reporting and archiving the following information as a minimum:

- (1) Outside air temperature history and degree day history
- (2) Electric demand and usage history
- (3) All trended points
- (4) All alarms and messages
- (5) Equipment runtime information

The system shall also provide the following additional reports for which archiving is not applicable:

- 1) All points summary
- 2) Building operating schedules
- 3) Printout of any graphic screen

The system shall be capable of providing all points summaries on a hierarchical basis. e.g., Only the points associated with a particular graphic shall be selectable and printed. For example, if the operator is viewing an chiller (Ch-1), he may request an all points summary at this level and receive only the points associated with the CH-1. If the building is being viewed and an all points summary selected, all building points will be listed. Similarly, the system shall print building operating schedules pertinent to the graphic level being viewed. e.g., If a zone or tenant zone group is being viewed on the graphic display, then the system shall be capable of printing the building operating schedules for the zone or tenant zone group. If the entire building graphic is being viewed, the system shall be capable of printing schedules at the building level.

All system reports shall be capable of being viewed at the operator's terminal and printed at the operator's discretion.

F. Custom Reports and Logs

The operator shall be able to create custom report and logging formats using the DOS based text editor program provided as part of the requirement for this project.

The operator shall be able to have the system report desired point data from the field, insert the data in the custom report format, store the report on disk as well as have it print out on the system and/or remote printers.

Custom report generation can be initiated either manually, based on a field occurrence or based on time, or any combination.

G. Dynamic Live Graphical Software Displays

The automation system shall be able to display, while online and running, the Live Graphic Function Block of all BACnet created software programs within the system.

The Live Graphic Function Block shall display real and dynamically updated data for each Microblock in the Graphic Function Block software program without degradation of system performance.

The system shall report any discrepancies between parameter information stored in the modules and the parameter information stored in the computer.

The system shall allow the operator to edit a Graphic Function Block's operating parameters from the Live Graphic Function Block screen without having to go to any other screen. Any changes to operating parameters will be automatically downloaded from the Live Graphic Function Block screen.

3.8 DIRECT DIGITAL CONTROL SOFTWARE

The system shall continuously perform DDC functions at the local Control Module in a stand-alone mode. The operator shall be able to design and modify the control loops to meet the requirements of the system being operated. The operators shall use system provided displays for tuning of PID loops. These displays shall include the past three input variable values, the setpoint for the loop as well as the sample interval and the results of the proportional, integral and derivative effects on the final output.

Each Control module shall perform the following functions:

- (1) Identify and report alarm conditions
- (2) Execute DDC algorithms
- (3) Execute all application programs indicated on the I/O Summary Table
- (4) Trend and store data

In the event of a Control module failure, all points under its control shall be commanded to the failure mode as indicated on the I/O Summary Table.

All DDC software shall reside in the respective Control module.

Power Failure/Automatic Restart at the Control module

- 1) Power failures shall cause the Control module to go into an orderly shutdown with no loss of program memory.
- 2) Upon resumption of power, the Control module shall automatically restart and printout the time and date of the power failure and restoration at the respective Workstation system.
- 3) The restart program shall automatically restart affected field equipment. The operator shall be able to define an automatic power up time delay for each piece of equipment under control.

3.9 APPLICATIONS SOFTWARE

The following applications software shall be provided for the purpose of optimizing energy consumption while maintaining occupant comfort:

A. Time of Day Scheduling (TOD)

The system shall be capable of the following scheduling features:

- (1) Scheduling by building, area, zone, groups of zones, individually controlled equipment and groups of individually controlled equipment. Each schedule shall provide beginning and ending dates and times (hr.: minutes). A weekly repeating schedule, i.e. between 8:00 a.m. and 5:00 p.m., Monday through Friday shall constitute one schedule, not five.
- (2) Allowing dated schedules to be entered up to (nine) 9 years in advance.
- (3) Schedules shall be self deleting when effective dates have passed.
- (4) Automatically adjusting for leap years.

For maximum speed in the communication of schedules, the operator shall have the ability to communicate schedules at the most efficient level with one scheduling command through the mouse interface. This ranges from system-wide to individual zones, groups or pieces of equipment.

The system shall allow the operator to designate any combination of equipment to form a group that can be scheduled with a single operator command through the mouse interface at the workstation. Any designated group shall have the capability to be a member of another group.

The operator shall be able to make all schedule additions, modifications and deletions using the mouse and "pop-up" menus.

The operator shall have the ability to edit all schedules off line and then download any or all schedule changes to the control modules with a single operator command through the mouse interface.

The operator shall have the ability to upload any or all schedules from a control module in the event the schedule in the module is different from the data base in the Workstation being used.

The operator shall be able to view a color coded, five-day graphic forecast of schedules for instant overview of facilities schedules. Schedule graphic forecast shall include colored coded indication of all types of schedules, i.e. normal, holiday and override.

B. Optimum Start/Stop (OSS)/Optimum Enable/Disable (OED)

Provide software to start and stop equipment on a sliding schedule based on the individual zone temperature and the heating/cooling capacity in °F/hr. of the equipment serving that zone. The heating/cooling capacity value shall be operator adjustable.

Temperature compensated peak demand limiting shall remain in effect during morning start up to avoid setting a demand peak.

C. Source Temperature Optimization (STO)

The system shall be capable of automatically optimizing all air handling units, chillers and boilers in response to the needs of other downstream pieces of equipment, by increasing or decreasing supply temperature setpoints, i.e. chilled water, discharge air, etc. using owner defined parameters.

The STO program will allow setpoints for various equipment in the heating/cooling chain to float

between an owner defined maximum and a minimum setpoint based on the actual requirements of the building zones. The actual setpoint shall be calculated based on the number of heating or cooling requests which are currently being received from the equipment or zones served. Once every update period, the STO program surveys the network to see if any piece of equipment requires any additional heating or cooling from its source.

As an example, a VAV air handler is the source of cold air for a number of VAV boxes. Assume that the STO program for the air handler has the following parameters established for it by the owner:

Optimized setpoint description -

Initial setpoint 60.00 Max. setpoint 65.00 Min. setpoint 55.00

Every 2.0 mins, trim by 0.25 and respond by -0.50 but no more than 2.0

Every two minutes, the STO program will total up all of the requests and calculate a new setpoint:

New setpoint = previous setpoint + "trim by" + ("respond by" x no. of req.)

Assuming 4 requests were received and the previous setpoint was 57.00 degrees, the new setpoint would be:

New setpoint = 57.00 + 0.25 + (-0.50 x 4) = 55.25 Degree F

If the number of requests received multiplied times the "respond by" value is greater than the "but no more than" value, the "but no more than" value is used inside the parenthesis in the above calculation.

D. Demand Limiting (DL) - Temperature Compensated

Application shall be programmable for a minimum of six separate time of day KW demand billing rate periods.

The system shall be capable of measuring electrical usage from multiple meters serving one building and each piece of equipment being controlled on the LAN shall be programmable to respond to the peak demand information from its respective meter.

The demand control function shall utilize a sliding window method with the operator being able to establish the kilowatt threshold for a minimum of three adjustable demand levels. Sliding window interval shall be operator selectable in increments of one minute, up to 60 minutes. Systems that incorporate rotating shed tables will not be acceptable.

The operator shall have the capability to set the individual equipment temperature setpoints for each operator defined demand level. Equipment shall not be shed if these reset setpoints are not satisfied, rather the setpoint shall be revised for the different established demand levels.

The system shall have failed meter protection, such that when a KW pulse is not received from the utility within an operator adjustable time period, an alarm will be generated. The system software will automatically default to a predetermined fail safe shed level.

The system shall have the ability to archive demand and usage information for use at a later time. System shall permit the operator access to this information on a current day, month-to-date and a year- to-date basis.

E. Day/Night Setback (DNS)

The system shall allow the space temperature to drift down (up) within a preset (adjustable) unoccupied temperature range. The heating (cooling) shall be activated upon reaching either end of the DNS range and shall remain activated until the space temperature returns to the DNS range.

The system shall be capable of closing all outside air and exhaust air dampers during the unoccupied period, except for 100% outside air units.

Unoccupied space temperature shall be monitored by the DDC temperature sensors located in the individual zones being controlled or within a representative room in the building if full DDC control is not being effected.

User shall be able to define, modify or delete the following parameters.

- (1) DNS setpoint temperature(s)
- (2) Temperature band for night heating operation
- (3) Period when the DNS is to be activated

F. Timed Local Override (TLO)

The system shall have TLO input points which permit the occupants to request an override of equipment which has been scheduled OFF. The system shall turn the equipment ON upon receiving a request from the local input device. Local input devices shall be push-button (momentary contact), wind-up timer, or ON/OFF switches as detailed in the I/O summary.

If a push-button is used the system operator shall be able to define the duration of equipment ON timer input pulse and the total maximum ON time permitted. Override time already entered shall be cancelable by the occupant at the input point. If a wind up timer is used the equipment will stay in override mode until the timer expires.

Year-to-date, month-to-date and current day override history shall be maintained for each TLO input point. History data shall be accessible by the operator at any time and shall be capable of being automatically stored on hard disk and/or printed on a daily basis.

G. Direct Digital Zone Control

The Zone Control Module and Terminal Control Module shall provide the application software described above; Time of Day Scheduling, Start/Stop Optimization, Source Optimization, Temperature Compensated Duty Cycling, Peak Demand Limiting with Temperature Compensation, Day/Night Setback, and additionally Trend Logging, Reports and Archiving, Graphic Structure, and Dynamic Live Graphical Displays

The Zone Control Module and Terminal Control Module shall provide all necessary control strategies user definable and down loadable from the Workstation) and necessary hardware to control and monitor the VAV Terminal Box, Water Source Heat Pump, Fan Coil Unit, Unit Ventilator, and Packaged AC Unit.

3.10 COMMISSIONING PROCEDURES

3.10.1 Evaluations

The Contractor shall make the observations, adjustments, calibrations, measurements, and tests of the control systems, set the time schedule, and make any necessary control system corrections to ensure that the systems function as described in the sequence of operation.

3.11 BALANCING, COMMISSIONING, AND TESTING

3.11.1 Coordination with HVAC System Balancing

Commissioning of the control system, except for tuning of controllers,

shall be performed prior to or simultaneous with HVAC system balancing. The contractor shall tune the HVAC control system after all air system and hydronic system balancing has been completed, minimum damper positions set and a report has been issued.

3.11.2 Control System Calibration, Adjustments, and Commissioning

Control system commissioning shall be performed for each HVAC system, using test plans and procedures previously approved by the Government. The Contractor shall provide all personnel, equipment, instrumentation, and supplies necessary to perform commissioning and testing of the HVAC control system. All instrumentation and controls shall be calibrated and the specified accuracy shall be verified using test equipment with calibration traceable to NIST standards. Wiring shall be tested for continuity and for ground, open, and short circuits. Mechanical control devices shall be adjusted to operate as specified. HVAC control panels shall be pretested off-site as a functioning assembly ready for field connections, calibration, adjustment, and commissioning of the operational HVAC control system. Control parameters and logic (virtual) points including control loop setpoints, gain constants, and integral constraints, shall be adjusted before the system is placed on line. Written notification of any planned commissioning or testing of the HVAC Control systems shall be given to the Government at least 14 calendar days in advance.

3.11.3 Performance Verification Test

The Contractor shall demonstrate compliance of the HVAC control system with the contract documents. Using test plans and procedures previously approved by the Government, the Contractor shall demonstrate all physical and functional requirements of the project. The performance verification test shall show, step-by-step, the actions and results demonstrating that the control systems perform in accordance with the sequences of operation. The performance verification test shall not be started until after receipt by the Contractor of written permission by the Government, based on Government approval of the Commissioning Report and completion of balancing. The tests shall not be conducted during scheduled seasonal off periods of base heating and cooling systems.

3.11.4 Posted and Panel Instructions

Posted and Panel Instructions, showing the final installed conditions, shall be provided for each system. The posted instructions shall consist of laminated half-size drawings and shall include the control system schematic, equipment schedule, sequence of operation, wiring diagram, communication network diagram, and valve schedules. The posted instructions shall be permanently affixed, by mechanical means, to a wall near the control panel. Panel instructions shall consist of laminated letter-size sheets and shall include a Routine Maintenance Checklist and as-built configuration check sheets. Panel instructions and one copy of the Operation and Maintenance Manuals, previously described herein, shall be placed inside each control panel or permanently affixed, by mechanical means, to a wall near the panel.

3.12 TRAINING

3.12.1 Training Course Requirements

A training course shall be conducted for 3_operating staff members

designated by the Contracting Officer in the maintenance and operation of the system, including specified hardware and software. The training period, for a total of 32 hours of normal working time, shall be conducted within 30 days after successful completion of the performance verification test. The training course shall be conducted at the project site. Audiovisual equipment and 3 sets of all other training materials and supplies shall be provided. A training day is defined as 8 hours of classroom instruction, including two 15 minute breaks and excluding lunchtime, Monday through Friday, during the daytime shift in effect at the training facility.

3.12.2 Training Course Content

For guidance in planning the required instruction, the Contractor shall assume that attendees will have a high school education or equivalent, and are familiar with HVAC systems. The training course shall cover all of the material contained in the Operating and Maintenance Instructions, the layout and location of each HVAC control panel, the layout of one of each type of unitary equipment and the locations of each, the location of each control device external to the panels, preventive maintenance, troubleshooting, diagnostics, calibration, adjustment, commissioning, tuning, and repair procedures. Typical systems and similar systems may be treated as a group, with instruction on the physical layout of one such system. The results of the performance verification test and the calibration, adjustment and commissioning report shall be presented as benchmarks of HVAC control system performance by which to measure operation and maintenance effectiveness.

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SECTION 15951A

DIRECT DIGITAL CONTROL FOR HVAC

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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

Codes and Regulations: All electrical equipment and material and its installation shall conform to the current requirements of the following authorities; Occupational Safety and Health Act (OSHA); Uniform Building Code; National Fire Code; National Electrical Code; Uniform Mechanical Code; National Standard Plumbing Code; UL916

Note: Where two or more codes conflict, the most restrictive shall apply. Nothing in these plans and specifications shall be construed to permit work not conforming to applicable codes.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B40.1 (1991) Gauges - Pressure Indicating Dial
Type - Elastic Element

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE Std 142 (1991) IEEE Recommended Practice for
Grounding of Industrial and Commercial
Power Systems

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA 250 (1991) Enclosures for Electrical Equipment
(1000 Volts Maximum)

NEMA ICS 1 (1993) Industrial Control and Systems

NEMA ST 1 (1988) Specialty Transformers (Except
General-Purpose Type)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (1999) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL 508

(1993; Rev thru Oct 1997) Industrial
Control Equipment

1.2 GENERAL REQUIREMENTS

The direct digital control (DDC) shall be a complete system suitable for the heating, ventilating and air-conditioning (HVAC) system. The Contractor shall utilize the existing Operator Workstation located in the building 430. The system specified in this document is an extension of the existing Native BACnet DDC control system. See paragraph Building Systems Integration. .

Standard Products

Material and equipment shall be the standard products of Delta Controls or equal or of other manufacturers as described herein, and each component shall provide the discrete functions indicated. Combining of components or discrete component functions by using multiple function devices which have not been indicated, and deviation from indicated logic shall not be permitted. Items of equipment (individual control system components such as pressure sensors, controllers, temperature probes) shall essentially duplicate equipment that has been in satisfactory use at least 2 years prior to bid opening. All equipment, including installation materials, shall conform to the requirements of the Buy American Act or shall be of American manufacture and assembly. Specific acceptable items of foreign manufacture are identified herein. Any equipment or material which does not meet these requirement shall be subject to removal and replacement at no additional cost to the Government.

Identical Items

Items of equipment that perform the same function shall be identical, including equipment, assemblies, parts, and components.

Configuration

The Contractor shall configure the Direct Digital Control (DDC) system as described and shown. System shall be listed per UL 916. Direct Digital Control panels shall be fully capable of controlling their respective systems with or without communication with any host computer system. All computing devices, as defined in FCC rules and Regulations, Part 15, shall be certified to comply with the requirements for Class A computing devices and labelled as set forth in FCC Rules and Regulations Part 15, Subpart J. The system shall provide operator interaction through a Delta Controls workstation or at a local operators terminal. DDC panels shall manage all control functions within their data environment as specified. Every connected analog output (AO), analog input (AI), Binary output (BO), and Binary input (BI), represents a point where referred to in this specification.

Connection to Base-Wide Native BACnet System

The contractor shall be responsible for connection and integration of the Direct Digital Control (DDC) system to the existing base-wide Native BACnet Energy Management and Control System (EMCS). This includes providing all equipment, cabling, software, programming, installation, commissioning, and training unless noted otherwise.

Database Definition and Graphic Generation

Contractor shall generate required database definitions compatible with the existing EMCS databases. They shall also generate complete and accurate dynamic graphics representations of each air handling unit system and all other systems as identified in the I/O summary charts as well as complete building floor plans showing individual space sensed and set point temperature and humidity conditions.

Extension of Base EMCS Fiber-optic Network

This section covers required network cabling and equipment in each building from communications patch panel, located in the communications room, to the Operator Workstations and Master DDC System Controller. Extension of EMCS' dedicated fiber-optic cable from nearest source to each building's communications patch panel is provided under Section 01007 ELECTRICAL REQUIREMENTS, paragraphs EMCS DISTRIBUTION & INTERIOR COMMUNICATIONS SYSTEM

1.2.1 Nameplates, Lens Caps, and Tags

Nameplates and lens caps bearing legends tags bearing device-unique identifiers shall have engraved or stamped characters. A plastic or metal tag shall be mechanically attached directly to each device or attached by a metal chain or wire.

1.2.2 Verification of Dimensions

After becoming familiar with all details of the work, the Contractor shall verify all dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing any work.

1.2.3 Drawings

Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings, and accessories that may be required. The Contractor shall carefully investigate the mechanical, electrical, and finish conditions that could affect the work to be performed, shall arrange such work accordingly, and shall furnish all work necessary to meet such conditions.

1.2.4 OVERVIEW

This document contains the minimum specification, input/output summaries for a Native BacNet Direct Digital Control (DDC) system for this project. The system architecture shall utilize intelligent distributed control modules, located at each site, which directly communicate over an EIA-485 BacNet controller network. Operator Workstations may be connected to the controller network via direct EIA-232, modem, or EtherNet local area network connections through a microprocessor based communication device.

The Operator Workstations shall utilize the existing Windows 95 compatible computers with color monitor and associated printer, and are located at building 320. The system shall provide the Direct Digital Control (DDC), Energy Management, and Building Automation for the air conditioning, heating and ventilating systems and shall interface with other micro-processor based systems as shown on the drawings and as specified.

1.2.5 BACnet COMPATIBILITY

The system must be fully BACnet compatible at the time of bid. This means that the system must use BACnet as the native communication protocol (no "gateways", translators, etc.) between controllers and must, as a minimum, be Conformance Class 3 and support the following Objects;

- Binary Input
- Binary Output
- Binary Value
- Analog Input
- Analog Output
- Analog Value

The communication network between controllers must be EIA-485, using 156 kbps ARCNET at the Data Link Layer for primary equipment controllers (AHU's, Pumps, chillers, etc.) and at least 38.4 Kbps MSTP for all room level terminal controls.

If the system is not fully BACnet compatible (Native Language) at the time of the bid, the vendors bid shall be in noncompliance with the specification and shall be deemed nonresponsive. Systems which are not BacNet compatible as specified above are not acceptable.

1.2.6 INSTRUCTIONS TO BIDDERS

The system specified in this document is an extension of the existing Native BACnet DDC control system or equal.

1.2.7 SCOPE OF WORK

A. Contractor's Responsibilities

A The Contractor shall furnish and install all necessary hardware, wiring, computing equipment and software as defined in this specification.

B System Requirements

(1) All material and equipment used shall be standard components, regularly manufactured and available, and not custom designed especially for this project. All systems and components, except site specific software, shall have previously been thoroughly tested and proven in actual use prior to installation on this project.

(2) The system architecture shall be fully modular permitting expansion of application software, system peripherals, and field hardware.

(3) The system, upon completion of the installation and prior to acceptance of the project, shall perform all operating functions as detailed in this specification.

C Equipment

(1) System Hardware

The Contractor shall provide the following:

- (a) Operator Workstation(s) and Control Modules
- (b) All sensing devices and necessary transducers to perform the functions listed in I/O Summary Tables
- (c) All relays, switches, indicating devices, and transducers required to

perform the functions listed in I/O Summary Tables

- (d) All monitoring and control wiring
- (e) All modems and accessories

(2) System Software

The Contractor shall provide all software identified in Part 3 of this specification. The database required for implementation of these specification shall be provided by the Contractor, including: point descriptor, alarm limits, calibration variables, graphics, reports and point summaries.

D. Input/Output Summary Table

The system as specified shall monitor, control, and calculate all of the points and perform all the functions as listed in I/O Summary Tables.

1.2.8 GENERAL CONDITIONS

A. Changes in the Work

Within the general scope of the contract, The Contracting Officer, without invalidating the contract may order changes in the work consisting of additions, deletions, or other revisions, the contract sum and the contract time being adjusted accordingly. All such changes in the work shall be authorized by written Change Order, and shall be executed under the applicable conditions of the Contract Documents.

B. Correction of Work

(1) The Contractor shall promptly correct all work The Contracting Officer finds defective or failing to conform to the Contract Documents. The Contractor shall bear all cost of correcting such work.

(2) If, within the warranty period required by the Contract Documents, any of the work is found to be defective or not in accordance with the contract documents, the Contractor shall correct it promptly after receipt of a written notice from The Contracting Officer to do so. The Contractor Officer shall give notice promptly after discovery of the condition.

C. Coordination During Construction

(1) The Contractor shall coordinate any necessary changes in work scheduling with The Contracting Officer to minimize the disruption.

(2) The Contractor shall protect the installed works by other trades.

(3) The Contractor shall coordinate with other trades.

(4) The Contractor shall repair any damage caused by his work to building(s) and equipment at no additional cost to Government.

D. Warranty

The Contractor shall warrant that all systems, subsystems, component parts, and software are fully free from defective design, materials, and workmanship for a period of one year from the date of final acceptance by

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

HVAC Control System; G-AE.

Drawings shall be on 34 by 22 inch sheets in the form and arrangement shown. The drawings shall use the same abbreviations, symbols, nomenclature and identifiers shown. Each control system element on a drawing shall have a unique identifier as shown. The HVAC Control System Drawings shall be delivered together as a complete submittal. Deviations must be approved by the Contracting Officer. Drawings shall be submitted along with Submittal SD-01, Data.

a. HVAC Control System Drawings shall include the following:

Sheet One: Drawing Index, HVAC Control System Legend.
Sheet Two: Valve Schedule, Damper Schedule.
Sheet Three: Not Used.
Sheet Four: Control System Schematic and Equipment Schedule.
Sheet Five: Sequence of Operation .
Sheet Six: Control Loop Wiring Diagrams.
Sheet Seven: Motor Starter and Relay Wiring Diagram.
Sheet Eight: Communication Network and Block Diagram.
Sheet Nine: DDC Panel Installation and Block Diagram.

(Repeat Sheets Four through Seven for each AHU System.)

b. The HVAC Control System Drawing Index shall show the name and number of the building, site, State or other similar designation, and Country. The Drawing Index shall list HVAC Control System Drawings, including the drawing number, sheet number, drawing title, and computer filename when used. The HVAC Control System Legend shall show generic symbols and the name of devices shown on the HVAC Control System Drawings.

c. The valve schedule shall include each valve's unique identifier, size, flow coefficient Cv, pressure drop at specified flow rate, spring range, positive positioner range, actuator size, close-off pressure data, dimensions, and access and clearance requirements data. Valve schedules may be submitted in advance but shall be included in the complete submittal.

d. The damper schedule shall contain each damper's and each actuator's identifier, nominal and actual sizes, orientation of axis and frame, direction of blade rotation, spring ranges, operation rate, positive positioner ranges, locations of actuators and damper end switches, arrangement of sections in multi-section dampers, and methods of connecting dampers, actuators, and linkages. The Damper Schedule shall include the maximum leakage rate at the operating static-pressure differential. The Damper Schedule shall contain actuator selection data supported by calculations of the torque required to move and seal the dampers, access and clearance requirements. Damper schedules may be submitted in advance but shall be included in the complete submittal.

e. Not UsedT.

f. The HVAC control system schematics shall be in the form shown, and shall show all control and mechanical devices associated with the HVAC system. A system schematic drawing shall be submitted for each HVAC system.

g. The HVAC control system equipment Schedule shall be in the form shown. All devices shown on the drawings having unique identifiers shall be referenced in the equipment schedule. Information to be included in the equipment schedule shall be the control loop, device unique identifier, device function, setpoint, input range, and additional important parameters (i.e., output range). An equipment schedule shall be submitted for each HVAC system.

h. The HVAC control system sequence of operation shall reflect the language and format of this specification, and shall refer to the devices by their unique identifiers. No operational deviations from specified sequences will be permitted without prior written approval of the Contracting Officer. Sequences of operation shall be submitted for each HVAC control system including each type of terminal unit control system.

i. The HVAC control system wiring diagrams shall be functional wiring diagrams which show the interconnection of conductors and cables to HVAC control panel terminal blocks and to the identified terminals of devices, starters and package equipment. The wiring diagrams shall show necessary jumpers and ground connections. The wiring diagrams shall show the labels of all conductors. Sources of power required for HVAC control systems and for packaged equipment control systems shall be identified back to the panel board circuit breaker number, HVAC system control panel, magnetic starter, or packaged equipment control circuit. Each power supply and transformer not integral to a controller, starter, or packaged equipment shall be shown. The connected volt-ampere load and the power supply volt-ampere rating shall be shown. Wiring diagrams shall be submitted for each HVAC control system.

j. Six copies shop drawings shall be submitted and shall consist of a complete list of equipment and materials, including manufacturer's descriptive and technical literature, catalog cuts, and installation instructions. Shop drawings shall also contain complete wiring, routing, schematic diagrams, tag number of devices, software descriptions, calculations, and any other details required to demonstrate that the system will function properly. Drawings shall show proposed layout and installation of all equipment and the relationship to other parts of the work.

Shop drawings shall be approved before any equipment is installed. Therefore, shop drawings must be submitted in time for Contracting Officer's review so that all installations can be completed per the project's completion schedule. Twenty working days shall be allowed for The Contracting Officer to review submittals.

All drawings shall be reviewed after the final system checkout and updated or corrected to provide 'as-built' drawings to show exact installation. All shop drawings will be acknowledged in writing by Contracting Officer before installation is started and again after the final checkout of the system. The system will not be considered complete until the 'as-built' drawings have received their final approval. The Contractor shall deliver <6> sets of 'as-built' drawings.

Before final configuration, the Contractor shall provide I/O Summary forms to Contracting Officer that include:

- (a) Description of all points
- (b) Listing of binary and analog hardware required to interface to the equipment for each function
- (c) Listing of all application programs associated with each piece of equipment
- (d) Failure modes for control functions to be performed in case of failure

k. The Contractor shall provide an accurate graphic flow diagram for each software program proposed to be used on the project as part of the submittal process. Revisions made as a result of the submittal process, during the installation, start-up or acceptance portion of the project, shall be accurately reflected in the "as-built" graphic software flow diagrams herein required by this specification.

SD-03 Product Data

Equipment Compliance Booklet; G-AE.

The HVAC Control System Equipment Compliance Booklet (ECB) shall be in booklet form and indexed, with numbered tabs separating the information on each device. It shall consist of, but not be limited to, data sheets and catalog cuts which document compliance of all devices and components with the specifications. The ECB shall be indexed in alphabetical order by the unique identifiers. Devices and components which do not have unique identifiers shall follow the devices and components with unique identifiers and shall be indexed in alphabetical order according to their functional name. The ECB shall include a Bill of Materials for each HVAC Control System. The Bill of Materials shall function as the Table of Contents for the ECB and shall include the device's unique identifier, device function, manufacturer, model/part/catalog number used for ordering, and tab number where the device information is located in the ECB. The ECB shall be submitted along with Submittal SD-04, Drawings.

SD-06 Test Reports

Commissioning Report; G-AE

Six copies of the HVAC Control System Commissioning Report, in booklet form and indexed, within 30 days after completion of the system commissioning. The commissioning report shall include data collected during the HVAC control system commissioning procedures and shall follow the format of the commissioning procedures. The commissioning report shall include all configuration checksheets with final values listed for all parameters, setpoints, P, I, D setting constants, calibration data for all devices, results of adjustments, and results of testing.

Performance Verification Test Report; G-AE

Six copies of the HVAC Control System Performance Verification Test Report, in booklet form and indexed, within 30 days after completion of the test. The HVAC control system performance verification test report shall include data collected during the HVAC control system performance verification test. The original copies of all data gathered during the performance verification test shall be turned over to the Government after Government approval of the test results.

SD-07 Certificates

Commissioning Procedures; G-AE.

Six copies of the HVAC control system commissioning procedures, in booklet form and indexed, 60 days prior to the scheduled start of commissioning. Commissioning procedures shall be provided for each HVAC control system, and for each type of terminal unit control system. The Commissioning procedures shall reflect the format and language of this specification, and refer to devices by their unique identifiers. The Commissioning procedures shall be specific for each HVAC system, and shall give detailed step-by-step procedures for commissioning of the system.

a. The Commissioning procedures shall include detailed, product specific set-up procedures, configuration procedures, adjustment procedures, and calibration procedures for each device. Where the detailed product specific commissioning procedures are included in manufacturer supplied manuals, reference may be made in the HVAC control system commissioning procedures to the manuals.

b. An HVAC control system commissioning procedures equipment list shall be included that lists the equipment to be used to accomplish commissioning. The list shall include manufacturer name, model number, equipment function, the date of the latest calibration, and the results of the latest calibration.

Performance Verification Test Procedures; G-AE.

Six copies of the HVAC Control System Performance Verification Test Procedures, in booklet form and indexed, 60 days before the Contractor's scheduled test dates. The performance verification test procedures shall refer to the devices by their unique identifiers, shall explain, step-by-step, the actions and expected results that will demonstrate that the HVAC control system performs in accordance with the sequences of operation, and other contract documents. An HVAC control system performance verification test equipment list shall be included that lists the equipment to be used during performance verification testing. The list shall include manufacturer name, model number, equipment function, the date of the latest calibration, and the results of the latest calibration.

Training Course Materials; G-AE

An outline for the HVAC control system training course with a proposed time schedule. Approval of the planned training schedule shall be obtained from the Government at least 60 days prior to the start of the training. Six copies of HVAC control system training course material 30 days prior to the scheduled start of the training course. The training course material shall include the operation manual, maintenance and repair manual, User manual, Engineering manual, Software documentation and paper copies of overheads used in the course.

ASME Air-Storage Tank Certificate; G-RE

An ASME Air-Storage Tank Certificate for each storage tank.

SD-10 Operation and Maintenance Data

Operation Manual/Maintenance and Repair Manual; G-AE

Six copies of the HVAC Control System Operation Manual, User's manual, Engineering manual, software documentation and HVAC Control System Maintenance and Repair Manual, for each HVAC control system, 30 days before the date scheduled for the training course.

Project Specific Manuals

Reference manuals for the system shall include the following categories: Users Manual, Engineering Handbook, and software documentation. Project specific manuals shall include detailed information describing the specific installation at F.E. Warren AFB.

Users Manual

a. System reference material shall contain as a minimum, an overview of the system, its organization, the concepts of networking and operator workstation/field hardware relationships as well as the following:

- (1) Activating the operator workstation
- (2) Using the mouse
- (3) Operator Workstation screen menus and their definitions
- (4) Establishing setpoints and schedules
- (5) Uploading and downloading software, setpoints, schedules, operating parameters and status between the operator workstation and field hardware
- (6) Collecting trend data and generating trend plots
- (7) Enabling alarms and messages
- (8) Report generation
- (9) Backing up software and data files
- (10) Using the operator workstation with 'third party' software

Engineering Manual

a. It shall include detailed information on:

- (1) Hardware--cutsheets and product descriptions.
- (2) Engineering--design requirements for initial installations and/or additions to existing systems .
- (3) Installation--mounting and connection details for field hardware, accessories and operator workstation equipment.
- (4) Field hardware set-up, checkout and tuning techniques.
- (5) Operator Workstation set-up, software loading and checkout techniques
- (6) A listing of basic terminology, standard alarms and messages, error messages and frequently used commands.

Software Documentation

(a) Shall contain as a minimum descriptions of the control software programs used in the system. Descriptions shall include:

- (1) Diagrams and listings showing maximum input/output point configurations for controlled equipment.
- (2) A description of the control elements and sequences available for the equipment.
- (3) A listing of the information which is displayed to the operator for each piece of controlled equipment.
- (4) A listing of the alarm and message conditions which may be detected for each piece of controlled equipment and the standard alarm and message texts which can be displayed when those conditions exist.
- (5) A graphic flow diagram for each software application program provided

as part of this project.

1.4 DELIVERY AND STORAGE

Products shall be stored with protection from the weather, humidity and temperature variations, dirt and dust, and other contaminants, within the storage condition limits published by the equipment manufacturer. Dampers shall be stored so that seal integrity, blade alignment and frame alignment are maintained.

1.5 OPERATION MANUAL

An HVAC control system operation manual in indexed booklet form shall be provided for each HVAC control system. The operation manual shall include the HVAC control system sequence of operation, and procedures for the HVAC system start-up, operation and shut-down. The operation manual shall include as-built HVAC control system detail drawings. The operation manual shall include the as-built configuration checksheets, the procedures for changing HVAC control system setpoints, and the procedures for placing HVAC system controllers in the manual control mode.

a. The procedures for changing HVAC control system setpoints shall describe the step-by-step procedures required to change the process variable setpoints, the alarm setpoints, the bias settings, and setpoint reset schedules.

b. The procedures for placing HVAC system controllers in the manual control mode shall describe step-by-step procedures required to obtain manual control of each controlled device and to manually adjust their positions.

1.6 MAINTENANCE AND REPAIR MANUAL

An HVAC control system maintenance and repair manual in indexed booklet form in hardback binders shall be provided for each HVAC control system. The maintenance and repair manual shall include the routine maintenance checklist, a recommended repair methods list, a list of recommended maintenance and repair tools, the qualified service organization list, the as-built commissioning procedures and report, the as-built performance verification test procedures and report, and the as-built equipment data booklet.

a. The routine maintenance checklist shall be arranged in a columnar format. The first column shall list all devices listed in the equipment compliance booklet, the second column shall state the maintenance activity or state no maintenance required, the third column shall state the frequency of the maintenance activity, and the fourth column for additional comments or reference.

b. The recommended repair methods list shall be arranged in a columnar format and shall list all devices in the equipment data compliance booklet and state the guidance on recommended repair methods, either field repair, factory repair, or whole-item replacement.

c. The as-built equipment data booklet shall include the equipment compliance booklet and manufacturer supplied user manuals and information.

d. If the operation manual and the maintenance and repair manual are provided in a common volume, they shall be clearly differentiated and

separately indexed.

1.7 MAINTENANCE AND SERVICE

Services, materials and equipment shall be provided as necessary to maintain the entire system in an operational state as specified for a period of one year after successful completion and acceptance of the Performance Verification Test. Impacts on facility operations shall be minimized.

1.7.1 Description of Work

The adjustment and repair of the system shall include the manufacturer's required adjustments of computer equipment, software updates, transmission equipment and instrumentation and control devices.

1.7.2 Personnel

Service personnel shall be qualified to accomplish work promptly and satisfactorily. The Government shall be advised in writing of the name of the designated service representative, and of any changes in personnel.

1.7.3 Scheduled Inspections

Two inspections shall be performed at six-month intervals (or less if required by the manufacturer), and all work required shall be performed. Inspections shall be scheduled in June and December. These inspections shall include:

- a. Visual checks and operational tests of equipment.
- b. Fan checks and filter changes for control system equipment.
- c. Clean control system equipment including interior and exterior surfaces.
- d. Check and calibrate each field device. Check and calibrate 50 percent of the total analog points during the first inspection. Check and calibrate the remaining 50 percent of the analog points during the second major inspection. Certify analog test instrumentation accuracy to be twice that of the device being calibrated. Randomly check at least 25 percent of all digital points for proper operation during the first inspection. Randomly check at least 25 percent of the remaining digital points during the second inspection.
- e. Run system software diagnostics and correct diagnosed problems.
- f. Resolve any previous outstanding problems.

1.7.4 Scheduled Work

This work shall be performed during regular working hours, Monday through Friday, excluding legal holidays.

1.7.5 Emergency Service

The Government will initiate service calls when the system is not functioning properly. Qualified personnel shall be available to provide service to the system. A telephone number where the service supervisor can

be reached at all times shall be provided. Service personnel shall be at the site within 24 hours after receiving a request for service. The control system shall be restored to proper operating condition within three calendar days after receiving a request for service.

1.7.6 Operation

Scheduled adjustments and repairs shall include verification of the control system operation as demonstrated by the applicable tests of the performance verification test.

1.7.7 Records and Logs

Dated records and logs shall be kept of each task, with cumulative records for each major component, and for the complete system chronologically. A continuous log shall be maintained for all devices. The log shall contain initial analog span and zero calibration values and digital points. Complete logs shall be kept and shall be available for inspection onsite, demonstrating that planned and systematic adjustments and repairs have been accomplished for the control system.

1.7.8 Work Requests

Each service call request shall be recorded as received and shall include the serial number identifying the component involved, its location, date and time the call was received, nature of trouble, names of the service personnel assigned to the task, instructions describing what has to be done, the amount and nature of the materials to be used, the time and date work started, and the time and date of completion. A record of the work performed shall be submitted within 5 days after work is accomplished.

PART 2 PRODUCTS

2.1 GENERAL EQUIPMENT REQUIREMENTS

Units of the same type of equipment shall be products of a single manufacturer. Each major component of equipment shall have the manufacturer's name and address, and the model and serial number in a conspicuous place. Materials and equipment shall be standard products of a manufacturer regularly engaged in the manufacturing of such products, which are of a similar material, design and workmanship. The standard products shall have been in a satisfactory commercial or industrial use for two years prior to use on this project. The two years' use shall include applications of equipment and materials under similar circumstances and of similar size. The two years' experience shall be satisfactorily completed by a product which has been sold or is offered for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures. Products having less than a two-year field service record will be acceptable if a certified record of satisfactory field operation, for not less than 6,000 hours can be shown. The equipment items shall be supported by a service organization. Items of the same type and purpose shall be identical, including equipment, assemblies, parts and components. Automatic temperature controls shall be direct digital controls that will provide the required sequence of operation. Is an extension of the existing Native BACnet DDC control system or equal.

2.1.1 Electrical and Electronic Devices

Electrical, electronic, and electropneumatic devices not located within a

DDC panel shall have a NEMA ICS 1 enclosure in accordance with NEMA 250 unless otherwise shown.

2.1.2 Standard Signals

Except for air distribution terminal unit control equipment, The output of all analog transmitters and the analog input and output of all DDC controllers shall be 4-to-20 mA_{dc} signals. The signal shall originate from current-sourcing devices and shall be received by current-sinking devices.

2.1.3 Ambient Temperature Limits

DDC panels shall have ambient condition ratings of 35 to 120 degrees F and 10 to 95 percent relative humidity, noncondensing. Devices installed outdoors shall operate within limit ratings of minus 35 to plus 150 degrees F. Instrumentation and control elements shall be rated for continuous operation under the ambient environmental temperature, pressure, humidity, and vibration conditions specified or normally encountered for the installed location.

2.2 NOT USED

2.3 WIRING

2.3.1 Terminal Blocks

Terminal blocks shall be insulated, modular, feed-through, clamp style with recessed captive screw-type clamping mechanism, shall be suitable for rail mounting, and shall have end plates and partition plates for separation or shall have enclosed sides.

2.3.2 Control Wiring for 24-Volt Circuits

Control wiring for 24-volt circuits shall be 18 AWG minimum, stranded copper and shall be rated for 300-volt service.

2.3.3 Wiring for 120-Volt Circuits

Wiring for 120-volt circuits shall be 18 AWG minimum, stranded copper and shall be rated for 600-volt service.

2.3.4 Instrumentation Cable

Instrumentation cable shall be 18 AWG, stranded copper, single- or multiple-twisted, minimum 2 inch lay of twist, 100 percent shielded pairs, and shall have a 300-volt insulation. Each pair shall have a 20 AWG tinned-copper drain wire and individual overall pair insulation. Cables shall have an overall aluminum-polyester or tinned-copper cable-shield tape, overall 20 AWG tinned-copper cable drain wire, and overall cable insulation.

2.3.5 Transformers

Step down transformers shall be utilized where control equipment operates at lower than line circuit voltage. Transformers, other than transformers in bridge circuits, shall have primaries wound for the voltage available and secondaries wound for the correct control circuit voltage. Transformer shall be sized so that the connected load is 80 percent of the rated capacity or less. Transformers shall conform to UL 508 and NEMA ST 1.

2.4 ACTUATORS

Actuators shall be pneumatic and shall be provided with mounting and connecting hardware. Electric or Electronic actuators shall be used for variable air volume (VAV) air terminal units. Actuators shall fail to their spring-return positions on signal or power failure [except that VAV terminal unit actuators may be of the floating type]. The actuator stroke shall be limited in the direction of power stroke by an adjustable stop. Actuators shall have a visible position indicator. Actuators shall smoothly open or close the devices to which they are applied and shall have a full stroke response time of 60 seconds or less. Electric actuators shall have an oil-immersed gear train. Electric or electronic actuators operating in series shall have an auxiliary actuator driver. Electric or Electronic actuators used in sequencing applications shall have an adjustable operating range and start point. Pneumatic actuators shall be rated for 25 psig operating pressure except for high-pressure cylinder-type actuators.

2.4.1 Valve Actuators

Valve actuators shall be selected to provide a minimum of 125 percent of the motive power necessary to operate the valve over its full range of operation.

- a. Electronic direct-coupled actuation shall be provided.
- b. The actuator shall be direct-coupled over the shaft, enabling it to be mounted directly to the damper shaft without the need for connecting linkage. The fastening clamp assembly shall be of a "V" bolt design with associated "V" shaped toothed cradle attaching to the shaft for maximum strength and eliminating slippage. Spring return actuators shall have a "V" clamp assembly of sufficient size to be directly mounted to an integral jackshaft of up to 1.05 inches when the damper is constructed in this manner. Single bolt or screw type fasteners are not acceptable.
- c. The actuator shall have electronic overload or digital rotation sensing circuitry to prevent damage to the actuator throughout the entire rotation of the actuator. Mechanical end switches or magnetic clutch to deactivate the actuator at the end of rotation are not acceptable.
- d. For power-failure/safety applications, an internal mechanical spring return mechanism shall be built into the actuator housing. Non-mechanical forms of fail-safe operation are not acceptable.
- e. All spring return actuators shall be capable of both clockwise or counterclockwise spring return operation by simply changing the mounting orientation.
- f. Proportional actuators shall accept a 0 to 10 VDC control input and provide a 2 to 10 VDC operating range. An actuator capable of accepting a pulse width modulating control signal and providing full proportional operation of the damper is acceptable. All actuators shall provide a 2 to 10 VDC position feedback signal.
- g. All 24 VAC/DC actuators shall operate on Class 2 wiring and shall not require more than 10 VA for AC or more than 8 watts for DC applications. Actuators operating on 120 VAC power shall not require more than 10 VA. Actuators operating on 230 VAC shall not require more than 11 VA.

h. All non-spring return actuators shall have an external manual gear release to allow manual positioning of the damper when the actuator is not powered. Spring return actuators with more than 60 in-lb torque shall have a manual crank for this purpose.

i. All modulating actuators shall have an external, built-in switch to allow the reversing of direction of rotation.

j. Actuators shall be provided with a conduit fitting and a minimum three-foot electrical cable and shall be pre-wired to eliminate the necessity of opening the actuator housing to make electrical connections.

k. Actuators shall be Underwriters Laboratories Standard 873 listed and Canadian Standards Association Class 4813 02 certified as meeting correct safety requirements and recognized industry standards.

(l) Actuators shall be designed for a minimum of 60,000 full stroke cycles at the actuator's rated torque and shall have a 2-year manufacturer's warranty, starting from the date of installation. Manufacturer shall be ISO9001 certified. Actuators shall be manufactured by Delta Controls Corporation or equal.

2.4.2 Positive Positioners

Positive positioners are required for pneumatic actuators. Each positive positioner shall be a pneumatic relay with a mechanical feedback mechanism and an adjustable operating range and starting point.

2.5 AUTOMATIC CONTROL VALVES

Valves shall have stainless-steel stems and stuffing boxes with extended necks to clear the piping insulation. Unless otherwise stated, valves shall have globe style bodies. Valve bodies shall be designed for not less than 125 psig working pressure or 150 percent of the system operating pressure, whichever is greater. Valve leakage rating shall be 0.01 percent of rated Cv. Unless otherwise specified, bodies for valves 1-1/2 inches and smaller shall be brass or bronze, with threaded or union ends; bodies for 2 inch valves shall have threaded ends; and bodies for valves 2 to 3 inches shall be of brass, bronze or iron. Bodies for valves 2-1/2 inches and larger shall be provided with flanged-end connections. Valve Cv shall be within 100 to 125 percent of the calculated Cv .

2.5.1 Butterfly Valve Assembly

Butterfly valves shall be threaded lug type suitable for dead-end service and modulation to the fully-closed position, with carbon-steel bodies and noncorrosive discs, stainless steel shafts supported by bearings, and EPDM seats suitable for temperatures from minus 20 to plus 250 degrees F. Valves shall have a manual means of operation independent of the actuator. The rated Cv for butterfly valves shall be the value of Cv at 70% open (60 degrees open).

2.5.2 Two-Way Valves

Two-way modulating valves shall have equal-percentage characteristics.

2.5.3 Three-Way Valves

Three-way valves shall provide linear flow control with constant total flow

throughout full plug travel.

2.5.4 Not Used

2.5.5 Valves for Chilled-Water, and Glycol Service

Internal valve trim shall be bronze except that valve stems may be type 316 stainless steel. Valve Cv shall be within 100 to 125 percent of the calculated Cv. Valves 4 inches and larger shall be butterfly.

2.6 Valves for Hot-Water Temperature Service

For hot water service below 250 degrees F internal trim (including seats, seat rings, modulating plugs, and springs) of valves controlling water hotter than 210 degrees F shall be Type 316 stainless steel. Internal trim for valves controlling water 210 degrees F or less shall be brass or bronze. Nonmetallic parts of hot-water control valves shall be suitable for a minimum continuous operating temperature of 250 degrees F or 50 degrees F above the system design temperature, whichever is higher. Valves 4 inches and larger shall be butterfly valves.

2.7 HTHW CONTROL VALVES

HTW control valves shall be two-way pattern of the proportioning type as indicated for the sequence specified. Valves bodies shall be rated for not less than 300 psig. Valves shall be tight closing type. Valve actuator for HTW shall be NC with proportional operator and adjustable stroke. Ambient temperature range is -25-150 degrees F. Body shall carbon steel, globe type and flanged end. Packing shall be Teflon-impregnated asbestos. Valve trim shall be Type 316 stainless steel. Valve shall have close-off rating for pressure and temperature of 300-400 psig, inlet and 250 degrees F, 400 psig for return side. Each valve for proportioning service shall have a contoured plug with equal percentage characteristics and a range ability of 50:1, minimum. Each valve shall be provided with valve-stem travel indicator or means of indicating position of the plug.

2.8 INSTRUMENTATION

2.8.1 Measurements

Transmitters shall be calibrated to provide the following measurements, over the indicated ranges, for an output of 4 to 20 mAdc:

a. Temperature Sensors.

Sensors shall be of the type and have accuracy ratings as indicated and/or required for the application and shall permit accuracy rating of within 1% of the temperature range of their intended use.

OA temperature sensors shall have a minimum range of -52°F to 152°F and an accuracy of within +1°F in this temperature range.

Chilled water and condenser water sensors shall have an accuracy of +0.36°F in their range of application.

Hot water sensors shall have an accuracy of +0.75 degrees F over the range of their application

2.8.2 Temperature Instruments

2.8.2.1 Resistance Temperature Detectors (RTD)

Temperature sensors shall be 100 ohms 3- or 4-wire RTD. Each RTD shall be platinum with a tolerance of plus or minus 0.1 percent at 32 degrees F, and shall be encapsulated in epoxy, series 300 stainless steel, anodized aluminum, or copper. Each RTD shall be furnished with an RTD transmitter as specified, integrally mounted unless otherwise shown.

2.8.2.2 Continuous Averaging RTD

Continuous averaging RTDs shall have a tolerance of plus or minus 1.0 degree F at the reference temperature, and shall be of sufficient length to ensure that the resistance represents an average over the cross section in which it is installed. The sensing element shall have a bendable copper sheath. Each averaging RTD shall be furnished with an RTD transmitter to match the resistance range of the averaging RTD.

2.8.2.3 RTD Transmitter

The RTD transmitter shall match the resistance range of the RTD. The transmitter shall be a two-wire, loop powered device. The transmitter shall produce a linear 4-to-20 mA_{dc} output corresponding to the required temperature measurement. The output error shall not exceed 0.1 percent of the calibrated measurement.

2.8.3 Not Used

2.8.4 Electronic Airflow Measurement Stations and Transmitters

2.8.4.1 Stations

Each station shall consist of an array of velocity sensing elements and an air-flow straightener. Air-flow straightener shall be contained in a flanged sheet metal or aluminum casing. The velocity sensing elements shall be of the RTD or thermistor type, producing a temperature compensated output. The sensing elements shall be distributed across the duct cross section in the quantity and pattern specified by the published application data of the station manufacturer. The resistance to air flow through the airflow measurement station shall not exceed 0.08 inch water gauge at an airflow of 2,000 fpm. Station construction shall be suitable for operation at airflows of up to 5,000 fpm over a temperature range of 40 to 120 degrees F, and accuracy shall be plus or minus three percent over a range of 125 to 2,500 fpm. In outside air measurement or in low-temperature air delivery applications, the station shall be certified by the manufacturer to be accurate as specified over a temperature range of minus 20 to plus 120 degrees F. In outside air measurement applications, the air flow straightener shall be constructed of 1/8 inch aluminum honeycomb and the depth of the straightener shall not be less than 1.5 inches.

2.8.4.2 Transmitters

Each transmitter shall produce a linear, 4-to-20 mA_{dc}, output corresponding to the required velocity pressure measurement. The transmitter shall be a two-wire, loop powered device. The output error of the transmitter shall not exceed 0.5 percent of the calibrated measurement.

2.8.5 Pitot Tube Airflow Measurement Stations and Transmitters

2.8.5.1 Stations

Each station shall contain an array of velocity sensing elements and straightening vanes inside a flanged sheet metal casing. The velocity sensing elements shall be of the multiple pitot tube type with averaging manifolds. The sensing elements shall be distributed across the duct cross section in the quantity and pattern specified by the published installation instructions of the station manufacturer. The resistance to air flow through the airflow measurement station shall not exceed 0.08 inch water gauge at an airflow of 2,000 fpm. Station construction shall be suitable for operation at airflows of up to 5,000 fpm over a temperature range of 40 to 120 degrees F, and accuracy shall be plus or minus three percent over a range of 500 to 2,500 fpm. This device will not be used if the required velocity measurement is below 700 fpm or for outside airflow measurements.

2.8.5.2 Transmitters

Each transmitter shall produce a linear 4-to-20 mAdc output corresponding to the required velocity pressure measurement. Each transmitter shall have a low range differential pressure sensing element. The transmitter shall be a two-wire, loop powered device. Sensing element accuracy shall be plus or minus one percent of full scale, and overall transmitter accuracy shall be plus or minus 0.25 percent of the calibrated measurement.

2.8.6 Differential Pressure Instruments

The instrument shall be a pressure transmitter with an integral sensing element. The instrument over pressure rating shall be 300 percent of the operating pressure. The sensor/transmitter assembly accuracy shall be plus or minus two percent of full scale. The transmitter shall be a two-wire, loop-powered device. The transmitter shall produce a linear 4-to-20 mAdc output corresponding to the required pressure measurement.

2.8.7 Thermowells

Thermowells shall be Series 300 stainless steel with threaded brass plug and chain, 2 inch lagging neck and extension type well. Inside diameter and insertion length shall be as required for the application.

2.9 THERMOSTATS

Thermostat ranges shall be selected so that the setpoint is adjustable without tools between plus or minus 10 degrees F of the setpoint shown. Thermostats shall be electronic or electric.

2.10 PRESSURE SWITCHES AND SOLENOID VALVES

2.10.1 Pressure Switches

Each switch shall have an adjustable setpoint with visible setpoint scale. Range shall be as shown. Differential adjustment shall span 20 to 40 percent of the range of the device.

2.10.2 Differential-Pressure Switches

Each switch shall be an adjustable diaphragm-operated device with two SPDT contacts, with taps for sensing lines to be connected to duct pressure fittings designed to sense air pressure. These fittings shall be of the

angled-tip type with tips pointing into the air stream. The setpoint shall not be in the upper or lower quarters of the range and the range shall not be more than three times the setpoint. Differential shall be a maximum of 0.15 inch water gauge at the low end of the range and 0.35 inch water gauge at the high end of the range.

2.11 INDICATING DEVICES

2.11.1 Thermometers

2.11.1.1 Piping System Thermometers

Piping system thermometers shall have brass, malleable iron or aluminum alloy case and frame, clear protective face, permanently stabilized glass tube with indicating-fluid column, white face, black numbers, and a 9 inch scale. Thermometers for piping systems shall have rigid stems with straight, angular, or inclined pattern.

2.11.1.2 Piping System Thermometer Stems

Thermometer stems shall have expansion heads as required to prevent breakage at extreme temperatures. On rigid-stem thermometers, the space between bulb and stem shall be filled with a heat-transfer medium.

2.11.1.3 Nonaveraging Air-Duct Thermometers

Air-duct thermometers shall have perforated stem guards and 45-degree adjustable duct flanges with locking mechanism.

2.11.2 Pressure Gauges

Gauges shall be 2 inch (nominal) size, back connected, suitable for field or panel mounting as required, shall have black legend on white background, and shall have a pointer traveling through a 270-degree arc. Accuracy shall be plus or minus three percent of scale range. Gauges shall meet requirements of ASME B40.1.

2.11.2.1 Pneumatic Actuator Gauges

Gauges for indicating signal output to pneumatic actuators shall have an outer scale of 3 to 15 psig in 1 psig graduations.

2.11.2.2 Not Used

2.11.2.3 Hydronic System Gauges

Gauges for hydronic system applications shall have ranges and graduations as shown.

2.11.3 Low Differential Pressure Gauges

Gauges for low differential pressure measurements shall be a minimum of 3.5 inch (nominal) size with two sets of pressure taps, and shall have a diaphragm-actuated pointer, white dial with black figures, and pointer zero adjustment. Gauges shall have ranges and graduations as shown. Accuracy shall be plus or minus two percent of scale range.

2.12 CONTROL DEVICES AND ACCESSORIES

2.12.1 Relays

Control relay contacts shall have utilization category and ratings selected for the application, with a minimum of two sets of contacts (two normally open, two normally closed) enclosed in a dustproof enclosure. Relays shall be rated for a minimum life of one million operations. Operating time shall be 20 milliseconds or less. Relays shall be equipped with coil transient suppression devices to limit transients to 150 percent of rated coil voltage. Time delay relays shall be 2PDT with eight-pin connectors, dust cover, and a matching rail-mounted socket. Adjustable timing range shall be 0 to 5 minutes. Power consumption shall not be greater than three watts.

2.12.2 Not Used

2.12.3 Not Used

2.12.4 Not Used

2.12.5 Not Used

2.12.6 Current Sensing Relays

Current sensing relays shall provide a normally-open contact rated at a minimum of 50 volts peak and 1/2 ampere or 25 VA, noninductive. There shall be a single hole for passage of current carrying conductors. The devices shall be sized for operation at 50 percent rated current based on the connected load. Voltage isolation shall be a minimum of 600 volts.

2.13 NOT USED

2.14 CENTRAL HARDWARE

The system specified in this document is an extension of the existing Native BACnet or equal DDC control system.

2.14 BUILDING SYSTEMS INTEGRATION

All indicated equipment, and other Building Automation Control Systems, shall be required to have the ability to interface with the Native BACnet automation subsystem integration package called CONNECT. This package establishes seamless interconnection with third party electrical and mechanical building systems and other manufacturers Building Automation Systems (BAS). These subsystems and BAS systems shall be controlled and monitored through the existing Delta Controls system and shall be graphically programmed with Native BACnet programming package.

A. All desired system information to or from the indicated mechanical and electrical equipment shall be available to the Native BACnet system. The capability to interface with any desired point in the equipment control system shall be available to the Native BACnet system. No limits shall be placed by the manufacturer on the owner or Native BACnet with regard to the access of, or the transmission of, or what may be done with the data provided from the equipment control system.

B. Full cooperation by the equipment manufacturer in this Open Protocol effort shall be a requirement for bidding this project. No exceptions shall be allowed to this requirement, and no bid shall be accepted which does not define clearly and exactly how the proposed equipment will comply with this section.

C. If the equipment manufacturer does not have this capability, they shall contact the authorized Dealer involved for assistance and shall include in their equipment price any necessary equipment obtained from Delta Controls or equal to comply with this section.

D. Other BAS equipment suppliers shall provide this seamless integration through the use of a BACnet Portal as specified below:

(1) The Portal shall be a microprocessor-based communication device designed to provide seamless, two-way translation between two or more standard or non-standard protocols.

(2) The Portal shall be available for a variety of Data Link\Physical Layer configurations including PTP (point-to-point) via EIA-232, MS/TP via EIA-485, ARCNET over EIA-485, LonTalk, and EtherNet using the IEEE 802.2 standard approved for BACnet.

(3) In addition to BACnet (conformance class 4) the Portal shall also support other protocols including LONworks, SNMP, Modbus, J-Bus, Profibus, Batibus, CAB, and Fieldbus.

(4) The Portal shall have at least three communication ports. One shall be for communication between Native BACnet controllers. This network shall be EIA-485 running at 156 kbps using ARCNET. The other two communication ports shall have the ability to be configured for different protocols. One of these shall consist of a terminal board connector which is jumper selectable for EIA-232, 2-wire EIA-485, or 4-wire EIA-485. The other port shall consist of an EIA-232, 9-pin connector. Both ports shall be software selectable for up to 38.4k baud

(5) The Portal shall provide full custom programmability of the data flowing between the networks using the same graphical programming as specified in this specification. The system shall have the ability to create custom building control strategies using global data between networks.

2.15 PORTABLE OPERATOR TERMINAL

Portable Terminal. Provisions are not required for this project.

2.16 Not Used

2.17 FIELD HARDWARE

Field hardware must be of a modular design to ensure reliability and system performance.

A. Local Area Network Gateway - LANgate

(1) The LANgate shall be a microprocessor-based communications device which acts as a gateway between a Controller Network and a Local Area Network (LAN).

(2) Each LANgate shall support a controller network on which may reside any combination of up to 100 control modules. Control Modules shall be Multiple Function Blocks with Expanders (MX-Line), Single Equipment Controllers (S-Line), or Unitary Controllers (U-Line).

(3) The controller network shall use BACnet as its native communication

protocol. The communication between Control Modules shall be ARCNET at 156 kbps implemented over an EIA-485 unshielded twisted pair at the Data Link Layer.

(4) The LAN which interconnects LANgates may be configured as EIA-485 (38.4 kbps), EtherNet (10 Mbps), Token Ring (16 Mbps), or FDDI (100 Mbps), all of which may be implemented over fiber optic, twisted pair, or coaxial cable.

(5) The LANgate shall provide two EIA-232 ports which can be connected to Operator Workstations, portable computers, or modems.

(6) LANgate shall provide full arbitration between multiple users, whether they are communicating through the same or different LANgates.

(7) The LANgate shall be responsible for routing global information from the various controller networks which may be installed throughout a building.

(8) Up to a total of 255 LANgates can be added to the LAN, each supporting up to 100 controllers (total capacity exceeds 2,000,000 points per LAN).

B. Local Area Network Gateway Rack Mounted- EtherNet(LGRM-E)

Shall be located in the buildings Communication Equipment room unless otherwise directed.

(1) The LGRM-E shall be a microprocessor-based communications device which acts as a gateway between a controller network and a Local Area Network (LAN).

(2) Each LANgate shall support a controller network on which may reside any combination of up to 100 control modules. Control Modules shall be Multiple Function Blocks with Expanders (MX-Line), Single Equipment Controllers (S-Line), or Unitary/Terminal Controllers (U-Line).

(3) Not Used.

(4) The controller network shall use BACnet as its native communication protocol. The communication between Control Modules shall be ARCNET at 156 kbps implemented over an unshielded twisted pair. at the Data Link Layer.

(5) The LGRM-E shall configure as EtherNet 10Base-T(10 Mbps) which may be implemented over unshielded twisted pair.

(6) The LGRM-E shall provide two EIA-232 ports which can be connected to Operator Workstations, portable computers, or modems.

(7) LGRM-E shall provide full arbitration between multiple users, whether they are communicating through the same or different LGRM-E.

(8) The LGRM-E shall be responsible for routing global information from the various controller networks which may be installed throughout a building.

(9) Up to a total of 255 LANgates can be added to the LAN, each supporting up to 100 controllers (total capacity exceeds 2,000,000 points per LAN).

C. Gateway Communication Module - LGC

(1) The LGC is a microprocessor-based communication device which provides communication between the Operator Workstation and/or modem with the controller network.

(2) The LGC communicates with the Operator Workstation using an EIA-232 serial communication port.

(3) A second EIA-232 port allows the LGC to communicate with another Operator Workstation or a portable field computer either through a modem or

through a direct EIA-232 connection. The LGC also has a modem reset relay which is activated when the modem fails to respond to the LGC's command.

(4) Each EIA-232 port is switch selectable for up to 38.4 kbps

(5) Each LGC shall support a controller network on which may reside any combination of up to 100 control modules. Control Modules shall be Multiple Function Blocks with Expanders (MX-Line), System Controllers (S-Line), or Unitary Controllers (U-Line).

(6) Not Used.

(7) The controller network shall use BACnet as its native communication protocol. The communication between Control Modules shall be ARCNET at 156 kbps implemented over an unshielded twisted pair. at the Data Link Layer.

D. General Purpose Control Modules - MX-Line, M-Line, X-Line.

(1) The General Purpose Control Modules must use BACnet as the native communication protocol (no "gateways", translators, etc.) between controllers and must, as a minimum, be Conformance Class 3 and support the following Objects;

Binary Input
Binary Output
Binary Value
Analog Input
Analog Output
Analog Value

(2) Each control module must be capable of stand-alone direct digital operation utilizing its own 32 bit processor, non-volatile flash memory, input/output, 12 bit A to D conversion, clock/calendar and voltage transient and lightning protection devices. All non-volatile flash memory shall have a battery backup of at least five years. Firmware revisions to the module should be able to be made from the local workstation, portable operator terminals or from remote locations over modems or LAN's.

(3) The Multi-Purpose Control Modules (MX-Line) shall consist of several modules which provides different I/O point combinations. Additionally each MX-Line Control Module shall be able to connect through its expansion bus to up to five I/O Expander Boards (X-Line). These X-Line boards can expand the total point capacity of each M-Line Control Module up to 192 points.

(4) All point data, algorithms, and application software within a control module shall be custom programmable from the Operator Workstation.

(5) Each Control Module shall execute application programs, calculations, and commands via a 32 bit microcomputer resident in the Control module. The database and all application programs for each Control Module shall be stored in read/writable non-volatile flash memory within the Control Module and will be able to upload/download to/from the Operator Workstation.

(6) Each Control Module shall be connected to a BACnet controller network communicating to/from other Control Modules. Each Control module shall include self-test diagnostics which allow the Control module to automatically relay to the network controller any malfunctions or alarm conditions that exceed desired parameters as determined by programming input.

(7) Each Control module shall contain both software and hardware to perform full DDC/PID control loops.

(8) Each module shall contain an asynchronous serial port for the interface of maintenance personnel's portable computer. All network interrogation shall be possible through this port.

(9) Input-Output Processing

a. Digital outputs. Outputs shall be 24VAC or VDC maximum relay, 3 amp maximum current. Each configurable as normally open or normally closed, and either dry contact or bussed. Each output shall have a manual hand off or auto switch to allow for override and an LED to indicate the operating mode of the output.

b. Universal inputs. Thermistor - 10K Ohm at 77o F, 0-5VDC - 10K Ohm maximum source impedance, 0-20mA - 24 VDC loop power 250 Ohm input impedance, Dry Contact - 0.5mA maximum current.

c. Analog output electronics, voltage mode, 0-10VDC current mode (4-20mA).

d. Analog output pneumatic, 0-20psi. Each pneumatic output shall have a feedback valve to be used in the system for any software programming needs.

The feedback valve shall be the actual psi output value and not a calculated value. Each output shall have a manual override switch which will allow each output to be configured in one of three ways: open, closed, or automatic operation. An LED shall indicate the state of each output.

E. Single Equipment Control Module - S-Line

(1) The Single Equipment Control Modules must use BACnet as the native communication protocol between controllers and must, as a minimum, be Conformance Class 4 and support the following Objects;

Binary Input
Binary Output
Binary Value
Analog Input
Analog Output
Analog Value

(2) The control module must be capable of stand-alone direct digital operation utilizing its own 32 bit processor, non-volatile flash memory, input/output, 10 bit A to D conversion, clock/calendar and voltage transient and lightning protection devices. All non-volatile flash memory shall have a battery backup of at least five years. Firmware revisions to the module should be able to be made from the local workstation, portable operator terminals or from remote locations over modems or LAN's.

(3) All point data, algorithms, and application software within a local network shall be custom programmable from the Operator Workstation.

(4) Each Control Module shall execute application programs, calculations, and commands via a 32 bit microcomputer resident in the Control module. All operating parameters for each Control Module shall be stored in non-volatile flash memory within the Control Module and will be able to upload/download parameters to/from the Operator Workstation.

(5) Each Control Module shall be connected to a BACnet controller network communicating to/from other Control Modules and gateway. Each Control module shall include self-test diagnostics which allow the Control module to automatically relay to the network controller any malfunctions or alarm conditions that exceed desired parameters as determined by programming input.

(6) Each Control module shall contain both software and hardware to perform full DDC/PID control loops.

(7) An asynchronous serial port shall be provided for the interface of maintenance personnel's portable computer. All network interrogation shall be possible through this port.

(8) The S-Line Control Module shall be capable of being mounted directly in or on AHU equipment.

(9) The S-Line AHU Controller shall be capable of proper operation in an ambient temperature environment of -200F to +1500F.

(10) Input-Output Processing

a. Digital outputs. Outputs shall be 24VAC or VDC maximum relays, 3 amp maximum current. Each configurable as normally open or normally closed, and either dry contact or bussed. Each output shall have a manual hand off or auto switch to allow for override and an LED to indicate the operating mode of the output.

b. Universal inputs. Thermistor - 10K Ohm at 77o F, 0-5VDC - 10K Ohm maximum source impedance, 0-20mA - 24 VDC loop power 250 Ohm input impedance, Dry Contact - 0.5mA maximum current.

c. Analog output electronics, voltage mode, 0-10VDC current mode (4-20mA).

d. Enhanced Zone Sensor Input. The input shall provide one thermistor input, one local setpoint adjustment, one timed local override switch, and an occupancy LED indicator.

G. Unitary Control Modules -U-Line

UNI

(1) Each U-Line controller shall communicate with the controller network through the Unet Interface Module (UNI). The UNI shall provide one EIA-485 port for a controller network connection and one EIA-485 port for the Unet connection. In addition, a direct connect EIA-485 port shall also be provided for connection of a portable operator's computer.

(2) The Unet Interface Modules shall use BACnet as the native communication protocol between controllers on the controller network and must, as a minimum, be Conformance Class 4 and support the following Objects;

Binary Input
Binary Output
Binary Value
Analog Input
Analog Output
Analog Value

(3) The UNI shall utilize the Optomux open protocol for communication to the U-Line controllers. The communication speed between U-Line controllers shall be at least 38.4 kbps.

(4) An asynchronous serial port shall be provided on the UNI for the interface of maintenance personnel's portable computer. All network interrogation shall be possible through this port.

(5) Each UNI shall execute application programs, calculations, and

commands via a 32 bit microcomputer resident in the UNI. All operating parameters for each U-Line shall be stored in read/writable non-volatile flash memory within the UNI. All non-volatile memory shall have a battery backup of at least five years. Firmware revisions to the module should be able to be made from the local workstation, portable operator terminals or from remote locations over modems or LAN's.

(6) The UNI shall contain both software and hardware to perform full DDC/PID control loops. The U-Line controller shall be able to provide normal binary type output.

(7) Each UNI circuits shall be optically isolated.

U-Line

(8) U Line controllers shall be capable of providing the Direct Digital Control of single zone terminal HVAC units; Variable Air Volume Terminal Box, Fan Coil Units, Water Source Heat Pump Units, Unit Ventilators, etc.

(9) Each U-Line shall be able to support various type of zone temperature sensors, such as: temperature sensor only, temperature sensor with built-in local override switch, with setpoint adjustment switch.

(10) Each U-Line for VAV application shall have a built-in air flow transducer for accurate air flow measurement in order to provide the Pressure Independent VAV operation.

(11) Each U-Line controller for VAV applications shall have an integral direct coupled electronic actuator. The actuator shall provide on-off/floating point control with a minimum of 35 in-lb of torque. The assembly shall mount directly to the damper operating shaft with a universal V-Bolt clamp assembly. The actuator shall not require any limit switches, and should be electronically protected against overload. When reaching the damper or actuator end position, the actuator shall automatically stop. The gears shall be manually disengaged with a button on the assembly cover. The position of the actuator shall be indicated by a visual pointer. The assembly shall have an anti-rotational strap supplied with the assembly that will prevent lateral movement.

(12) Each U-Line and UNI shall have LED indication for visual status of communication, power, and all outputs.

(13) In the event of a loss of communication with the UNI, each U-Line controller shall control from stand alone algorithm which maintains the assigned space temperature until communication with the UNI is restored.

(14) Input/Output Processing

a. Digital outputs. Outputs shall be 24VAC or VDC maximum relays, 3 amp maximum current. Each configurable as normally open or normally closed, and either dry contact or bussed.

b. Universal inputs. Thermistor, dry contacts or 0-5VDC with 0-100K Ohm input impedance.

c. Enhanced Zone Sensor Input. The input shall provide one thermistor input, one local setpoint adjustment, one timed local override switch, and an occupancy LED indicator.

d. Analog output electronic, voltage mode 0-10VDC, current mode (4-20mA).

I. Field Testing and Programming Equipment

A portable laptop or notebook computer shall interface via standard push-in connection at an asynchronous serial port located at the Control modules and at selected enhanced zone temperature sensors as indicated on project plans. This portable unit shall be capable of full global communications with all Control modules connected within the respective network and shall provide functionally identical user interface to the Workstation, in non-graphic format. Units shall be able to interrogate all points and alter all programming.

2.18 BTU MONITORING SYSTEM EQUIPMENT

Primary flow measuring element shall be an in-line, vortex shedding type meter. The exact location and arrangement of pipe, upstream and downstream of the flow meter shall be based on the manufacturer's published recommendations, requirements, and specifications. The flow meter shall be identified by a stainless steel tag indicating manufacturer, serial number, K-factor and maximum output. Flow meter shall be equivalent in design and capability to the EMCO Model Vortex PhD series.

Field wiring for each sensor device shall be three conductor sized in accordance with Section: ELECTRICAL WORK, INTERIOR, solid copper, 300 volt, thermo-plastic twisted shielded instrumentation cable in conduit. All wires shall be terminated with pressure type connectors suitable for wire size and material as well as terminal connection.

a. Vortex Shedding Type Meters

Meter shall be factory wet flow calibrated. Calibration information shall be supplied with each meter. Meter accuracy shall be +/- 0.15% of flow rate. Meter shall be available for line sizes from 1 to 4 inches. Meter wing and shedder bar shall be constructed of stainless steel. Meter shall have a completely sealed body cavity tested per ASME/ANSI B16.34. Meter shall have an operating temperature range of -40 to 750 degrees F.. Meter shall have a process pressure rating of ANSI Class 150#. Meter shall operate linearly within Reynolds numbers of 20,000 to 7,000,000.

(1) Meter shall use dual piezoelectric sensor for noise rejection. Sensor shall be removable without process shutdown or the requirement of bypass piping. Sensor shall be removable at process pressures of up to 750 psig.

(2) Electronics shall be suitable for integral or remote type mounting. Electronics shall be equivalent in design and capability to EMCO's "EZ Logic" which enables the user to configure, diagnose and personalize each meter via a four-button keypad or magnet Wand without removing cover, flow rate and total shall be displayed in engineering units. Electronics enclosure shall be NEMA 4 type. Meter shall have digital noise filter. Meter shall have analog 4-20 mA output, voltage pulse output and open collector FET output.

(3) Temperature sensors shall be of the RTD type and shall be provided with 316 stainless steel wells with insertion length appropriate for the pipe size used. Sensor shall be provided with cast aluminum junction box for wiring terminations. Sensors shall be Model TEM-30 as manufactured by EMCO or equal.

b. Sensor Selection

(1) Select flow sensor to provide the accuracy stated for the output range from peak flow of 21.6 GP< to one-fourth of the peak flow.

(2) The RTD transmitters shall be selected to match the resistance range of the RTD. The transmitter shall produce a linear 4 to 20 maDC output corresponding to the required temperature span. One delta-T transmitter may be provided with a 4 to 20 maDC output for the delta-T temperature span of 0 to 50-degrees F.. The output error shall not exceed 0.1 percent of calibrated span. The trans-mitter shall include offset and span adjustments unless the RTD element is integral to the transmitter and system calibration is provided.

c. BTU COMPUTER (ie. Flow Processor)

The flow processor shall contain software capable of computing volumetric flow (actual or standard), mass flow and BTU usage for liquid. Processor must have 2 resettable and 2 no-resettable totalizer for user selected values. Processor shall have continuous diagnostics and displayed fault messages and shall be capable of accepting an 8-point flow calibration for linearization values (ave., min., max.) for all flow variables, and temperatures. Processor equipped with a 2-line x 16 character, alpha-numeric, LCD backlit display. Display shall illustrate flow values and engineering units on same screen. Display shall have both automatic or manual scanning of chosen flow values. Flow processor shall operate on 115 Vac, and shall produce the following outputs:

Power: 24 Vdc +/- 5% at 15 mA

Analog: isolated 4-20 mA dc

Relay: isolated solid state with AC or DC option

Flow processor shall have an operating temperature range of 32 to 122 degrees F.. Flow processor shall be provided in a NEMA 4 enclosure. Flow processor shall be equivalent in design and capability to the EMCO Model FP-93.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION CRITERIA

3.1.1 HVAC Control System

The HVAC control system shall be completely installed and ready for operation. Dielectric isolation shall be provided where dissimilar metals are used for connection and support. Penetrations through and mounting holes in the building exterior shall be made watertight. The HVAC control system installation shall provide clearance for control system maintenance by maintaining access space between coils, access space to mixed-air plenums, and other access space required to calibrate, remove, repair, or replace control system devices. The control system installation shall not interfere with the clearance requirements for mechanical and electrical system maintenance.

3.1.2 Not Used

3.1.3 Device Mounting Criteria

Devices mounted in or on piping or ductwork, on building surfaces, in mechanical/electrical spaces, or in occupied space ceilings shall be

installed in accordance with manufacturer's recommendations . Control devices to be installed in piping and ductwork shall be provided with required gaskets, flanges, thermal compounds, insulation, piping, fittings, and manual valves for shutoff, equalization, purging, and calibration. Strap-on temperature sensing elements shall not be used except as specified.

3.1.4 Wiring Criteria

Wiring external to control panels, including low-voltage wiring, shall be installed in metallic raceways. Nonmetallic-sheathed cables or metallic-armored cables may be installed in areas permitted by NFPA 70. Wiring shall be installed without splices between control devices and DDC panels. Instrumentation grounding shall be installed as necessary to prevent ground loops, noise, and surges from adversely affecting operation of the system. Ground rods installed by the contractor shall be tested as specified in IEEE Std 142. Cables and conductor wires shall be tagged at both ends, with the identifier shown on the shop drawings. Electrical work shall be as specified in Section 16415 ELECTRICAL WORK, INTERIOR and as shown.

3.2 CONTROL SYSTEM INSTALLATION

3.2.1 Damper Actuators

Actuators shall not be mounted in the air stream. Multiple actuators operating a common damper shall be connected to a common drive shaft. Actuators shall be installed so that their action shall seal the damper to the extent required to maintain leakage at or below the specified rate and shall move the blades smoothly.

3.2.2 Not Used

3.2.3 Room Instrument Mounting

Room instruments shall be mounted so that their sensing elements are 5 feet above the finished floor unless otherwise shown. Temperature setpoint device shall be recess mounted.

3.2.4 Freezestats

For each 20 square feet of coil face area, or fraction thereof, a freezestat shall be provided to sense the temperature at the location shown. Manual reset freezestats shall be installed in approved, accessible locations where they can be reset easily. The freezestat sensing element shall be installed in a serpentine pattern.

3.2.5 Averaging Temperature Sensing Elements

Sensing elements shall have a total element minimum length equal to 1 linear foot per square foot of duct cross-sectional area. Sensing elements shall have a total element minimum length equal to 1 linear foot per square foot of duct cross-sectional area.

3.2.6 Not Used

3.2.7 Not Used

3.2.8 Not Used

3.2.9 Indication Devices Installed in Piping and Liquid Systems

Gauges in piping systems subject to pulsation shall have snubbers. Thermometers and temperature sensing elements installed in liquid systems shall be installed in thermowells.

3.2.10 Not Used

3.3 CONTROL SEQUENCE OF OPERATION

Shall be as shown and as indicated on drawing.

3.4 SOFTWARE

GENERAL

A. The Contractor shall provide all software required for efficient operation of all the functions required by this specification. Software shall be modular in design for flexibility in expansion or revision of the system.

The software shall, as a minimum, include:

- (1) Complete database entry
- (2) Configuration of all application programs to provide the sequence of operation indicated
- (3) Graphics of each system as shown on the I/O Summary Tables
- (4) Alarm limits and alarm messages for all critical and non-critical alarms
- (5) Configuration of all reports and point summaries indicated

B. The software shall be provided in these five categories:

- (1) System executive software
- (2) Software for user control over system configuration at the CS location
- (3) Facility monitoring functions
- (4) Direct digital control
- (5) Application software

C. The system shall support Windows Dynamic Data Exchange (DDE).

The system shall allow any DDE or Net DDE compatible program to dynamically access status and parameter information within the SuperVision Program.

D. The system shall be fully Graphically Programmed.

The system shall include the ability for an operator to create his own Graphic Programming. This is a method by which a system programmer is allowed to create a sequence of operation by assembling graphic Microblocks that represent each of the commands necessary to complete a sequence. Microblocks represent common logical control devices used in conventional control systems, such as relays, switches, high signal selectors, etc., in addition to the more complex DDC and energy management strategies such as PID loops and optimum start. Each Microblock shall be interactive and contain the programming necessary to execute the function of the device it

represents.

Graphic Programming shall be performed while on screen and using a mouse; each Microblock shall be selected from a Microblock library and assembled with other Microblocks necessary to complete the specified sequence. Microblocks are then interconnected on screen using graphic "wires", each forming a logical connection. Once assembled, each logical grouping of Microblocks and their interconnecting wires then forms a graphic function block which may be used to control any piece of equipment with a similar point configuration and sequence of operation.

The clarity of the graphic sequence must be such that the user has the ability to verify that system programming meets the specifications, without having to learn or interpret a manufacturer's unique programming language. The graphic programming must be self-documenting and provide the user with an understandable and exact representation of each sequence of operation.

Full simulation capability shall also be provided with the graphic programming. User shall be able to fully simulate the constructed sequence on screen before the sequences are downloaded into the controllers. The System shall also include the ability to simulate multiple graphic programs communicating with each other on a simulated network.

The simulation must show each output value and how it varies in relation to an artificial time clock. The time clock may run at normal time increments, increased increments (fast motion) or decreased increments (slow motion).

The following is a minimum definition of the capabilities of the Graphic Programming software.

Function Block (FB) - Shall be a collection of points, Microblocks and wires which have been connected together for the specific purpose of controlling a piece of HVAC equipment or a single mechanical system.

Logical I/O (LIO's) - Input/Output points which shall interface with the control modules in order to read various signals and /or values or to transmit signal or values to controlled devices.

Microblocks - Shall be software devices which are represented graphically and may be connected together to perform a specified sequence.

Wires - Shall be Graphical elements which are used to form logical connections between Microblocks and between Microblocks and LIOs. Different wires types shall be used depending on whether the signal they conduct is analog or digital.

Labels - Labels shall be similar to wires in that they are used to form logical connections between two points. Labels shall form a connection by reference instead of a visual connection. i.e., two points labeled "A" on a drawing are logically connected even though there is no wire between them.

Parameter - A parameter shall be a value which may be tied to the input of a Microblock. Each parameter will then be displayed on the resulting FB parameter page and can be modified to varying degrees based upon the appropriate password level being used by the operator. Different parameter Microblocks shall be used depending on whether the parameter is digital or analog.

Constant - A constant shall be similar to a parameter except that it is displayed only in the graphic FB file itself and will not be displayed on any parameter page. Certain coefficients which are used in various calculations always remain constant and therefore should be constants which are embedded in the program and not parameters. Different constant Microblocks shall be used depending on whether the constant is digital or analog.

Pop-ups - Pop-ups shall appear after a Microblock has been inserted which has default parameters associated with it. Default parameter pop-ups shall contain various editable and non-editable fields and shall contain "push buttons" for the purpose of selecting default parameter settings.

Icon - An icon shall be graphic representation of a software program. Each graphic Microblock has an icon associated with it which graphically describes its function.

Menu-bar Icon - Shall be an icon which is displayed on the menu bar on the Native BACnet screen which represents its associated graphic Microblock.

3.5 SYSTEM SOFTWARE

A. The workstation shall display graphically, in up to 256 different colors, the following system information:

General area maps shall show locations of controlled buildings in relation to local landmarks.

Floor plan maps shall show heating and cooling zones throughout the buildings in a range of colors which provide a visual display of temperature relative to their respective setpoints. The colors shall be updated dynamically as zones' comfort condition change. Locations of space sensors shall also be shown for each zone. Setpoint adjustment and color band displays shall be provided as specified in specification section 3.05, D. 4 "Setpoints" below.

Mechanical system graphics shall show the type of mechanical system components serving any zone through the use of a pictorial representation of components. It shall also provide a current status of all I/O points being controlled and applicable to each piece of equipment including analog readouts in appropriate engineering units at appropriate locations on the graphic representation.

B. Each category of software shall consist of interactive software modules. Each module shall have an associated priority level and shall execute as determined by the program controller as defined in the real time operating system.

C. The workstation shall allow receipt of alarms and messages while in a functional mode other than energy management, i.e., incoming alarms shall be displayed while the operator is in a word processing, spreadsheet, or other operating mode. The system must automatically switch from a non-energy management mode, respond to an alarm, and return to the exact position left in the previous functional mode.

D. The building operator shall be able to communicate and direct all control functions through the use of a 2-button "mouse" operator interface

to monitor and control all functions and sequences within the system.

The following information shall be selectable from a button menu bar available on the bottom of the various graphics.

Exit	Trends	Help files
Reports	Setpoints	Download
Schedules	Module Status	Upload
Schedule Graphs	Parameters	Print
Utilities	Minimize	Manual commands
Groups	Return to last view	Point Help
	Live Graphic Function Blocks	

Programming, scheduling and setpoint changes shall be accessible for modification on each menu for the associated equipment. Operator shall be able to automatically download changes from the workstation to the appropriate program for the equipment being controlled. Operator shall be able to upload parameters setpoint information and schedules from the field modules to the workstation.

(1) Input Format.

Operators shall be able to control system functions based on their password level. The primary operator interface shall be via a two button mouse.

(2) Operator Commands.

All operator commands shall be in the graphics data base and menu driven. After the operator selects the desired object item or menu, the system shall display either the status of selected object item or the allowable options available. Upon entry of a command to the point or points desired as described above, the system shall, before performing any command, respond with an echo of the request. This echo feedback shall include the command requested and any entered data. System shall include error monitoring software for user's input error.

(3) Output Format.

The system shall operate on a System Format basis, regardless of the manner or hardware configuration in which the data is acquired. A "system" shall consist of a logical grouping of data points, related to a piece of mechanical equipment, an energy distribution system, or an architectural area. For example, in somecases, it may be desired to display, as a single system, a space temperature with its associated air handling unit, and in other cases to display all space temperatures on a floor or in a building. The system shall allow such determinations to be made without regard to the physical hardware locations of a point or group of points. Likewise, the system shall accommodate future changes of system grouping and operations without field hardware changes.

- a. All displays and logs shall contain a header line indicating date, day-of-week, and time.
- b. All output displays or logs of a point or group of points shall contain, as a minimum, the following information:

- (1) Graphic presentation of the System
- (2) User name of point
- (3) Point descriptor
- (4) Current value/status

- (5) Associated engineering units
- (6) Alarm description

c. User names, point descriptors, and engineering units shall be operator definable on a per point basis.

(4) Setpoints

The system shall utilize a contiguous band of colors each corresponding to actual zone temperatures relative to the desired heating and cooling setpoints. The ideal temperature shall be shown as a green color band. This color band corresponds to the dead band between the onset of mechanical heating or cooling. Temperatures slightly warmer than ideal shall be shown in yellow, and even warmer temperature band shall be shown in orange.

Temperatures slightly cooler than ideal shall be light blue, and even cooler temperatures shall be shown as dark blue. All alarm colors shall be in red.

The system shall be capable of utilizing the mouse operator interface device to change individual zone temperature bar and by pressing a button, and by moving the mouse cursor to an increased or decreased temperature setpoint within that zone. The system shall also be capable of utilizing the mouse interface device or a conventional keyboard to change a numeric temperature setpoint value instead of utilizing the graphic temperature bar. The floor plan graphic shall then be able to change colors on a zone by zone basis to reflect the actual temperature in each zone relative to the changed desired heating or cooling setpoint. The system shall be capable of globally changing all setpoints.

(5) Graphic Structure

The intent of the graphics is to ensure the operator is always aware of his position within the system as well as how to logically progress through the graphical hierarchy to select any desired graphic or other source of information. The system software shall provide the operator with the capability of returning to any previous graphic by pointing to a graphic tab then pushing a single button on the mouse operator interface.

The system software must be programmed to provide a separate color graphic for:

- (1) Each piece of equipment monitored or controlled including each terminal unit
- (2) Each building
- (3) Each floor and zone controlled
- (4) Each schedule
- (5) Each trend
- (6) Each report
- (7) Each Graphical Software Program

(6) Passwords

User Access Restriction. Operator sign-on shall require an assignable password. Each operator can be assigned to any one of ten levels of system access.

3.6 USER CONTROL OVER SYSTEM CONFIGURATION

A. Database Creation and Modification. All changes shall be done utilizing standard procedures and be capable of being done while the system is on-line and operational. The system shall allow changes to be made at the local site through a portable computer and at the workstation.

B. The system shall permit the operator to perform as a minimum the following:

- (1) Add and delete points
- (2) Modify point parameters
- (3) Create and modify control sequences and programs
- (4) Reconfigure application programs
- (5) Add and/or modify graphics

C. All data points within the database shall be completely accessible as independent or dependent variables for custom programming, calculation, interlocking, or manipulation.

D. Graphics Software.

The graphics software shall permit the easy construction of infinitely variable shapes and sizes through the use of the mouse pointing device.

A selection of 256 colors and various fill textures, line types and text styles shall all be accessible through the use of the mouse interface. The software shall resemble many of the computer aided design programs currently available and allow graphics to be easily moved, edited, added or deleted.

Graphics software shall be fully implemented and operational to accomplish the following:

- (1) Create a new graphic picture
- (2) Modify a portion of a graphic picture
- (3) Delete a graphic picture, or any portion thereof
- (4) Call up a graphic picture
- (5) Cancel the display of a graphic picture
- (6) Assign conditions which automatically initiate the display
- (7) Overlay alphanumeric and graphics
- (8) Save the graphic picture
- (9) Display latest process data fully integrated with the graphic display
- (10) Display Live Graphical Software Programs

E. The workstation must be able to generate standard ASCII file formats to allow use with third-party software (Lotus 123, etc.) to generate and store owner-designed reports.

3.7 FACILITY MANAGEMENT FUNCTIONS

A. Trend Logging

The system shall be able to trend and display either numerically or graphically any analog or digital physical point or calculated point or any output from any of the Microblocks in the Graphics Programs.

The system shall be able to simultaneously graphically display an unlimited number of trends at once (limited only by the resolution of the viewing

screen) of the most recent two hundred and eighty eight (288) samples. Sample intervals shall be as small as one (1) second. Each trended point will have the ability to be trended at a different trend interval. When multiple points are selected for display which have different trend intervals, the system will automatically scale the axis.

The system shall have the ability to view trends from anywhere within the same controller network simultaneously. Trends shall be picked from a hierarchical tree using the mouse (similar to Windows File Manager).

Trends shall be able to dynamically update at user defined intervals.

It shall be possible to Zoom-in on a particular section of a trend for more detailed examination.

It shall be possible to pick any point on an trend and have it numerical value displayed.

Each module shall be capable of automatically uploading on a daily basis all accumulated trend data to the workstation for permanent storage on hard disk.

B. Trend Historian (TH)

The system operator shall have the ability to set up a continuous trend of any point, as described above, for a limitless period of time.

Any point assigned to the TH will automatically upload to the workstation hard disk the trend information in groups of the most recent 288 samples. This will continue as long as the point is assigned to the TH.

The system operator will be able to simultaneously graphically display any four (4) values being trended by the TH.

The operator will be able to move back in time by clicking with the mouse on a button marked "back", or forward in time by clicking on a button marked "forward". The operator will also have the option of typing in a date in the approximate location which will automatically display the trend information for that time period.

C. Run Time

The system shall provide run time information for all digital output and input points for all modules on command from the operator. Maximum run time limits shall be operator definable and shall be capable of automatically issuing a printed message when the run time maximum is exceeded. The operator shall be able to reset the run time accumulator.

Run time hours and start time date shall be retained in non-volatile module memory.

Each module shall be capable of automatically uploading all accumulated data to the workstation for permanent storage on hard disk.

D -Alarm Event Routing And Tracking Software

The Alarm Management Software (AMS) shall be a comprehensive software package which runs in the Windows environment. It shall provide for creating alarming actions, generating alarm reporting actions, and

configuring alarming views. The AMS software shall provide as a minimum the following features. Any system not meeting these minimum requirements shall be unacceptable.

1. Database Tables

The software shall provide as a minimum five database tables that contain records configurable by the operator. These tables shall be Operators, Systems, Reporting Actions, Groups and Alarms. Each database shall be capable of the following:

a. Operators- The operator table shall contain information on operators who will be using the AMS. Once an operator has been created, and if that operator has acknowledged any alarms, the operator record shall not be able to be erased unless and until all alarms acknowledged by that operator have been deleted from the system database. There shall be no limit to the number of operators that can be added to the system.

Passwords- Each operator must have a password. This password is used to log into the system and may also be required to acknowledge alarms, if the alarm has been so configured. The password shall be up to 8 characters in length.

Level- Each operator shall have a security level assigned. A security level is a number that defines a level of access in the AMS. This security level is also assigned to commands and alarms. An operator must have a security level equal to or greater than a command's security level in order to perform that command. Additionally, an operator must have a security level equal to or greater than an alarm's level in order to acknowledge that alarm or change the status of that alarms Reporting Action. The software shall provide for at least 100 security levels.

b. Systems- The Systems database table shall allow the AMS software to have multiple systems or locations reporting to this one AMS database for alarm routing and management. An example would be, if there were multiple buildings located at multiple sites around the country all these Systems shall be able to be integrated, by this software, into one AMS database (in lieu of separate databases) for the purpose of alarm management routing and reporting.

c. Reporting Actions- A Reporting Action shall be the automatic procedure that is launched (under certain conditions) after an alarm is received by the AMS workstation station. The operator shall have the capability to define when these Reporting Actions will be launched. Reporting Actions shall be associated with alarms through Groups. When the AMS receives an alarm the operator shall have the capability to view the Reporting action status as they are launched and executed. The operator logged in at the receiving station that received the alarm shall have the ability to Abort or Execute the Reporting Action before its scheduled launch time if he/she has the proper security level. The following types of Reporting Actions shall be available:

ASCII File Write- The ASCII File Write Reporting Action (AFWRA) shall enable the operator to append operator-defined alarm information to any alarm through a text file. The alarm information that is written to the file shall be completely definable by the operator. The operator may enter text or attach other data point information (such as AHU discharge temperature and fan condition upon a high room temperature alarm)

Numeric Pager- The Numeric Pager Reporting Action (NPRA) pages personnel by sending numeric messages to personal pagers through the use of a third-party service (definable and subscribed to by the operator). The numeric message may consist of numeric text entered by the operator and/or the Alarm ID and Alarm Priority. The operator shall be able to define how many times to attempt to connect to the pager service. The operator shall also be able to define a secondary number to call in case the connection to the first number is unsuccessful. The entire cycle of calling can be repeated for as many times as the operator defines, or until a successful page is completed. Two different Numeric Pager Reporting Actions may be defined.

Parallel Printer- The Parallel Printer Reporting Action prints alarm information to a parallel printer. Two different Parallel Printer Reporting Actions may be defined.

Serial Output- The Serial Output Reporting Action (SORA) sends alarm information to a Video Display Terminal (VDT). The terminal can be directly connected to the receiving station, or it can be accessed by a modem-to-modem connection. The alarm information is sent to the VDT and displayed on the screen. If previous alarm information has been sent, the new information is displayed starting at the next available line on the screen. The alarm information shall also be able to be sent by a modem-to-modem connection to a remote serial printer.

Alphanumeric Pager- The Alphanumeric Pager Reporting Action (APRA) shall page personnel from the receiving station using an alphanumeric paging system or a third party alphanumeric pager service (definable and subscribed to by the operator). The paging system can be directly connected to the receiving station, or it can be accessed by a modem-to-modem connection. The alphanumeric page that is sent shall be completely configurable by the operator. Up to 30 pagers shall be able to be contacted with a single connection to the paging unit. Only paging systems that use the PET protocol (also called TAP protocol) shall be used.

After an individual reporting action is configured by the operator, the operator shall have the ability to fully test this action within the AMS system. All actions shall be tested without the need for any real point alarms from field panels.

d. Groups- Groups exist as organizers for Reporting Actions. Five different groups shall be available:

- Alarms-Urgent
- Alarms
- Massages
- Status reports
- Trend Reports

After a Group is configured with Reporting Actions, it can be associated with Alarm records when the alarm is configured

e. Alarms- There shall be two different kinds of alarm records in the AMS database:

Alarm Records- An alarm record is alarm information configured by the operator that corresponds to an alarm the AMS expects to receive. Once the AMS receives the alarm, the configured information is used by the AMS to display and handle the alarm.

Instance Record- An Instance record is a log record that is created when an alarm is received. The AMS shall log these alarms in the "instance" database.

All alarm generated at the direct digital controller level shall contain the following information as a minimum:

- (1) Time/Date Stamp as to when the alarm actually occurred
- (2) Building Identification
- (3) Alarm network address location
- (4) Unique assignment code of alarm ID

The AMS system shall be capable of configuring an unlimited number of alarm and/or alarm conditions. For each Alarm the following selections shall be available as a minimum in configuring how the alarm is reported, viewed and routed.

Multiline Text Field- Each alarm shall have a Text field which is a multi-line text. This information can be displayed with an alarm on the Main View of the AMS or sent to a serial output or a printer. The system shall allow the operator to enter regular text in this field (for example, "Boiler #3 has been shut down.") and/or Time, Date and Latched Data Values. Latched Data Values can be any digital or analog information available in the system which may have influenced the activation of that alarm/message. (i.e. a High Discharge Air Temperature alarm may also latch the current status of the Fan, Damper position, CFM, Cooling Valve position and Return Air Temperature). There shall be no limit to the length of the information which can be associated with an alarm.

Group Field- The Group Field shall be used to associate an Alarm record with a Group. Once an alarm is associated with a Group, any Reporting Actions that belong to that Group are launched after the AMS receives the alarm and the launching conditions are fulfilled.

Security Level Field- The Security Level field assigns a numeric level of access to the alarm. An operator must have the same security level as an alarm or higher in order to acknowledge it and to change the alarm's Reporting Actions' status. Security levels can range from 1-100, with "1" being the lowest and "100" being the highest.

(2) Views

The AMS shall provide seven different "Views" in which the different types of alarms are displayed. These views are as follows:

Alarms-Urgent
Alarms
Messages
Status Reports
Trend Reports
Closed
Unacknowledged

The following information shall be displayed for each alarm:

Alarm Type
Date and Time the alarm occurred
Alarm ID

System ID
Site
Alarm address
Tab Labels
Multi-line Alarm Text
Acknowledging Operator

Main View- The Main View shall provide the following as a minimum:

- a. Title Bar located at the top which contains the name of the AMS station.
- b. Menu Bar which shows all the pull-down selections available within the system.
- c. Alarm Display which shows alarms in a format called a "view".

(3) Handling Alarms

As specified before the AMS shall have the capability to display different "Views". These views display alarm information using different formats and filters. The print command can also be used to print the alarm information displayed in the Main View.

- a. Printing Alarms- The print command shall allow the operator to print all the alarms displayed in the Main View. Alarms shall be printed the way that they appear in the Main View.
- b. Not Used.
- c. Alarm Receiving- When an alarm is received it may be configured to require conditions to occur before it can be closed. If no conditions are required the alarm is received and immediately closed. The alarm could be required to go through any or all of the following states before being closed:

- (1) Active-Unacknowledged: An alarm that has not received a RTN message, and has not been acknowledge by the operator.
- (2) Active -Acknowledged: An alarm that has not received a RTN message but has been acknowledged.
- (3) Inactive-Unacknowledged: An alarm that has received a RTN message but has not been acknowledged.
- (4) Inactive-acknowledged: An alarm that has received a RTN message and has been acknowledged.
- (5) Closed: An alarm that has met all of the requirements.

Based on the above state of the alarm, various actions by the operator may be required in order to achieve the next state.

- d. Alarm Conditions- An alarm can be configured with multiple conditions that must be fulfilled before it can reach the Closed state.

An alarm shall be able to be configured to require an Acknowledgment before it can be Closed.

An alarm shall be able to be configured to launch a Reporting Action. This Reporting Action must be completed before the alarm can be Closed.

- e. Alarm Information Pop-Up- Specific information for an alarm can be viewed by double-clicking on the alarm from the Main View. This Pop-Up will display the Multiline Alarm Text associated with this alarm. There shall be no limitation to the length of this message. The text in this window cannot be cut, copied, or altered in any way.

f. Alarm Commands- There shall be several commands available for the operator to use to perform some kind of action. To perform an action on an alarm the operator shall select the alarm from the Main View, then select one of the following commands from the Menu Bar.

Silence- Alarms may require an operator notification if so configured. The operator can halt Notification with the Silence command. Acknowledging an alarm shall automatically silence an alarm.

Acknowledge- The Acknowledge command shall be performed by the operator currently logged in. Unlike the Silence command, the Acknowledge command is specific to an alarm. This command allows the operator to formally recognize individual alarms. Each alarm must be selected and acknowledged individually if it was configured to require acknowledgment. To acknowledge an alarm the operator must have a security level equal to or greater than the alarm. If the operator does not have a high enough security level, the AMS shall display an error message.

Delete- The Delete command allows an operator to delete an instance record from the instance database. When an alarm is deleted, it is removed from the Main View and the database permanently.

View Reporting Status- The View Reporting Status command allows an operator to view detailed information about an alarm's individual Reporting Actions which includes completion status as well as launch information. With this feature, an operator logged in at the receiving station also shall have the ability (given the appropriate security level) to abort and execute Reporting Actions early.

Building Management System- The BMS command shall allow an operator to go directly to the BMS graphic that was responsible for generating a particular alarm.

Acknowledge All in View- The Acknowledge All command shall work in the same manner as the Acknowledge command except that it acknowledges all alarms displayed in the current view. Alarms not displayed if the current view are not acknowledged.

Delete All in View- The Delete All command shall delete all alarms in the current view. If you wish to cancel the Delete All command while it is in progress, select the Cancel button from the Delete All pop-up. The Cancel command will only affect alarms that the AMS has not yet deleted.

Force Return to Normal- The Force RTN command allows the operator to have an alarm return to normal even though the alarm has not received an RTN message from the Module.

E. Reports and Archiving

The field modules shall be capable of calling the workstation during off peak phone rate hours to automatically upload all current and accumulated data. This shall be delivered to the workstation for printing and/or permanent storage on hard disk. The system shall further be capable of transferring hard disk information onto a floppy disk or magnetic tape for remote site storage.

The system shall be capable of reporting and archiving the following information as a minimum:

- (1) Outside air temperature history and degree day history
- (2) Electric demand and usage history
- (3) All trended points
- (4) All alarms and messages
- (5) Equipment runtime information

The system shall also provide the following additional reports for which archiving is not applicable:

- 1) All points summary
- 2) Building operating schedules
- 3) Printout of any graphic screen

The system shall be capable of providing all points summaries on a hierarchical basis. e.g., Only the points associated with a particular graphic shall be selectable and printed. For example, if the operator is viewing an chiller (Ch-1), he may request an all points summary at this level and receive only the points associated with the CH-1. If the building is being viewed and an all points summary selected, all building points will be listed. Similarly, the system shall print building operating schedules pertinent to the graphic level being viewed. e.g., If a zone or tenant zone group is being viewed on the graphic display, then the system shall be capable of printing the building operating schedules for the zone or tenant zone group. If the entire building graphic is being viewed, the system shall be capable of printing schedules at the building level.

All system reports shall be capable of being viewed at the operator's terminal and printed at the operator's discretion.

F. Custom Reports and Logs

The operator shall be able to create custom report and logging formats using the DOS based text editor program provided as part of the requirement for this project.

The operator shall be able to have the system report desired point data from the field, insert the data in the custom report format, store the report on disk as well as have it print out on the system and/or remote printers.

Custom report generation can be initiated either manually, based on a field occurrence or based on time, or any combination.

G. Dynamic Live Graphical Software Displays

The automation system shall be able to display, while online and running, the Live Graphic Function Block of all BACnet created software programs within the system.

The Live Graphic Function Block shall display real and dynamically updated data for each Microblock in the Graphic Function Block software program without degradation of system performance.

The system shall report any discrepancies between parameter information stored in the modules and the parameter information stored in the computer.

The system shall allow the operator to edit a Graphic Function Block's operating parameters from the Live Graphic Function Block screen without having to go to any other screen. Any changes to operating parameters will be automatically downloaded from the Live Graphic Function Block screen.

3.8 DIRECT DIGITAL CONTROL SOFTWARE

The system shall continuously perform DDC functions at the local Control Module in a stand-alone mode. The operator shall be able to design and modify the control loops to meet the requirements of the system being operated. The operators shall use system provided displays for tuning of PID loops. These displays shall include the past three input variable values, the setpoint for the loop as well as the sample interval and the results of the proportional, integral and derivative effects on the final output.

Each Control module shall perform the following functions:

- (1) Identify and report alarm conditions
- (2) Execute DDC algorithms
- (3) Execute all application programs indicated on the I/O Summary Table
- (4) Trend and store data

In the event of a Control module failure, all points under its control shall be commanded to the failure mode as indicated on the I/O Summary Table.

All DDC software shall reside in the respective Control module.

Power Failure/Automatic Restart at the Control module

- 1) Power failures shall cause the Control module to go into an orderly shutdown with no loss of program memory.
- 2) Upon resumption of power, the Control module shall automatically restart and printout the time and date of the power failure and restoration at the respective Workstation system.
- 3) The restart program shall automatically restart affected field equipment. The operator shall be able to define an automatic power up time delay for each piece of equipment under control.

3.9 APPLICATIONS SOFTWARE

The following applications software shall be provided for the purpose of optimizing energy consumption while maintaining occupant comfort:

A. Time of Day Scheduling (TOD)

The system shall be capable of the following scheduling features:

- (1) Scheduling by building, area, zone, groups of zones, individually controlled equipment and groups of individually controlled equipment. Each schedule shall provide beginning and ending dates and times (hr.: minutes). A weekly repeating schedule, i.e. between 8:00 a.m. and 5:00 p.m., Monday through Friday shall constitute one schedule, not five.
- (2) Allowing dated schedules to be entered up to (nine) 9 years in advance.
- (3) Schedules shall be self deleting when effective dates have passed.
- (4) Automatically adjusting for leap years.

For maximum speed in the communication of schedules, the operator shall have the ability to communicate schedules at the most efficient level with one scheduling command through the mouse interface. This ranges from system-wide to individual zones, groups or pieces of equipment.

The system shall allow the operator to designate any combination of equipment to form a group that can be scheduled with a single operator command through the mouse interface at the workstation. Any designated group shall have the capability to be a member of another group.

The operator shall be able to make all schedule additions, modifications and deletions using the mouse and "pop-up" menus.

The operator shall have the ability to edit all schedules off line and then download any or all schedule changes to the control modules with a single operator command through the mouse interface.

The operator shall have the ability to upload any or all schedules from a control module in the event the schedule in the module is different from the data base in the Workstation being used.

The operator shall be able to view a color coded, five-day graphic forecast of schedules for instant overview of facilities schedules. Schedule graphic forecast shall include colored coded indication of all types of schedules, i.e. normal, holiday and override.

B. Optimum Start/Stop (OSS)/Optimum Enable/Disable (OED)

Provide software to start and stop equipment on a sliding schedule based on the individual zone temperature and the heating/cooling capacity in °F/hr. of the equipment serving that zone. The heating/cooling capacity value shall be operator adjustable.

Temperature compensated peak demand limiting shall remain in effect during morning start up to avoid setting a demand peak.

C. Source Temperature Optimization (STO)

The system shall be capable of automatically optimizing all air handling units, chillers and boilers in response to the needs of other downstream pieces of equipment, by increasing or decreasing supply temperature setpoints, i.e. chilled water, discharge air, etc. using owner defined parameters.

The STO program will allow setpoints for various equipment in the heating/cooling chain to float

between an owner defined maximum and a minimum setpoint based on the actual requirements of the building zones. The actual setpoint shall be calculated based on the number of heating or cooling requests which are currently being received from the equipment or zones served. Once every update period, the STO program surveys the network to see if any piece of equipment requires any additional heating or cooling from its source.

As an example, a VAV air handler is the source of cold air for a number of VAV boxes. Assume that the STO program for the air handler has the following parameters established for it by the owner:

Optimized setpoint description -

Initial setpoint 60.00 Max. setpoint 65.00 Min. setpoint 55.00

Every 2.0 mins, trim by 0.25 and respond by -0.50 but no more than 2.0

Every two minutes, the STO program will total up all of the requests and calculate a new setpoint:

New setpoint = previous setpoint + "trim by" + ("respond by" x no. of req.)

Assuming 4 requests were received and the previous setpoint was 57.00 degrees, the new setpoint would be:

New setpoint = $57.00 + 0.25 + (-0.50 \times 4) = 55.25$ Degree F

If the number of requests received multiplied times the "respond by" value is greater than the "but no more than" value, the "but no more than" value is used inside the parenthesis in the above calculation.

D. Demand Limiting (DL) - Temperature Compensated

Application shall be programmable for a minimum of six separate time of day KW demand billing rate periods.

The system shall be capable of measuring electrical usage from multiple meters serving one building and each piece of equipment being controlled on the LAN shall be programmable to respond to the peak demand information from its respective meter.

The demand control function shall utilize a sliding window method with the operator being able to establish the kilowatt threshold for a minimum of three adjustable demand levels. Sliding window interval shall be operator selectable in increments of one minute, up to 60 minutes. Systems that incorporate rotating shed tables will not be acceptable.

The operator shall have the capability to set the individual equipment temperature setpoints for each operator defined demand level. Equipment shall not be shed if these reset setpoints are not satisfied, rather the setpoint shall be revised for the different established demand levels.

The system shall have failed meter protection, such that when a KW pulse is not received from the utility within an operator adjustable time period, an alarm will be generated. The system software will automatically default to a predetermined fail safe shed level.

The system shall have the ability to archive demand and usage information for use at a later time. System shall permit the operator access to this information on a current day, month-to-date and a year- to-date basis.

E. Day/Night Setback (DNS)

The system shall allow the space temperature to drift down (up) within a preset (adjustable) unoccupied temperature range. The heating (cooling) shall be activated upon reaching either end of the DNS range and shall remain activated until the space temperature returns to the DNS range.

The system shall be capable of closing all outside air and exhaust air dampers during the unoccupied period, except for 100% outside air units.

Unoccupied space temperature shall be monitored by the DDC temperature sensors located in the individual zones being controlled or within a representative room in the building if full DDC control is not being effected.

User shall be able to define, modify or delete the following parameters.

- (1) DNS setpoint temperature(s)
- (2) Temperature band for night heating operation
- (3) Period when the DNS is to be activated

F. Timed Local Override (TLO)

The system shall have TLO input points which permit the occupants to request an override of equipment which has been scheduled OFF. The system shall turn the equipment ON upon receiving a request from the local input device. Local input devices shall be push-button (momentary contact), wind-up timer, or ON/OFF switches as detailed in the I/O summary.

If a push-button is used the system operator shall be able to define the duration of equipment ON timer input pulse and the total maximum ON time permitted. Override time already entered shall be cancelable by the occupant at the input point. If a wind up timer is used the equipment will stay in override mode until the timer expires.

Year-to-date, month-to-date and current day override history shall be maintained for each TLO input point. History data shall be accessible by the operator at any time and shall be capable of being automatically stored on hard disk and/or printed on a daily basis.

G. Direct Digital Zone Control

The Zone Control Module and Terminal Control Module shall provide the application software described above; Time of Day Scheduling, Start/Stop Optimization, Source Optimization, Temperature Compensated Duty Cycling, Peak Demand Limiting with Temperature Compensation, Day/Night Setback, and additionally Trend Logging, Reports and Archiving, Graphic Structure, and Dynamic Live Graphical Displays

The Zone Control Module and Terminal Control Module shall provide all necessary control strategies user definable and down loadable from the Workstation) and necessary hardware to control and monitor the VAV Terminal Box, Water Source Heat Pump, Fan Coil Unit, Unit Ventilator, and Packaged AC Unit.

3.10 COMMISSIONING PROCEDURES

3.10.1 Evaluations

The Contractor shall make the observations, adjustments, calibrations, measurements, and tests of the control systems, set the time schedule, and make any necessary control system corrections to ensure that the systems function as described in the sequence of operation.

3.11 BALANCING, COMMISSIONING, AND TESTING

3.11.1 Coordination with HVAC System Balancing

Commissioning of the control system, except for tuning of controllers,

shall be performed prior to or simultaneous with HVAC system balancing. The contractor shall tune the HVAC control system after all air system and hydronic system balancing has been completed, minimum damper positions set and a report has been issued.

3.11.2 Control System Calibration, Adjustments, and Commissioning

Control system commissioning shall be performed for each HVAC system, using test plans and procedures previously approved by the Government. The Contractor shall provide all personnel, equipment, instrumentation, and supplies necessary to perform commissioning and testing of the HVAC control system. All instrumentation and controls shall be calibrated and the specified accuracy shall be verified using test equipment with calibration traceable to NIST standards. Wiring shall be tested for continuity and for ground, open, and short circuits. Mechanical control devices shall be adjusted to operate as specified. HVAC control panels shall be pretested off-site as a functioning assembly ready for field connections, calibration, adjustment, and commissioning of the operational HVAC control system. Control parameters and logic (virtual) points including control loop setpoints, gain constants, and integral constraints, shall be adjusted before the system is placed on line. Written notification of any planned commissioning or testing of the HVAC Control systems shall be given to the Government at least 14 calendar days in advance.

3.11.3 Performance Verification Test

The Contractor shall demonstrate compliance of the HVAC control system with the contract documents. Using test plans and procedures previously approved by the Government, the Contractor shall demonstrate all physical and functional requirements of the project. The performance verification test shall show, step-by-step, the actions and results demonstrating that the control systems perform in accordance with the sequences of operation. The performance verification test shall not be started until after receipt by the Contractor of written permission by the Government, based on Government approval of the Commissioning Report and completion of balancing. The tests shall not be conducted during scheduled seasonal off periods of base heating and cooling systems.

3.11.4 Posted and Panel Instructions

Posted and Panel Instructions, showing the final installed conditions, shall be provided for each system. The posted instructions shall consist of laminated half-size drawings and shall include the control system schematic, equipment schedule, sequence of operation, wiring diagram, communication network diagram, and valve schedules. The posted instructions shall be permanently affixed, by mechanical means, to a wall near the control panel. Panel instructions shall consist of laminated letter-size sheets and shall include a Routine Maintenance Checklist and as-built configuration check sheets. Panel instructions and one copy of the Operation and Maintenance Manuals, previously described herein, shall be placed inside each control panel or permanently affixed, by mechanical means, to a wall near the panel.

3.12 TRAINING

3.12.1 Training Course Requirements

A training course shall be conducted for 3_operating staff members

designated by the Contracting Officer in the maintenance and operation of the system, including specified hardware and software. The training period, for a total of 32 hours of normal working time, shall be conducted within 30 days after successful completion of the performance verification test. The training course shall be conducted at the project site. Audiovisual equipment and 3 sets of all other training materials and supplies shall be provided. A training day is defined as 8 hours of classroom instruction, including two 15 minute breaks and excluding lunchtime, Monday through Friday, during the daytime shift in effect at the training facility.

3.12.2 Training Course Content

For guidance in planning the required instruction, the Contractor shall assume that attendees will have a high school education or equivalent, and are familiar with HVAC systems. The training course shall cover all of the material contained in the Operating and Maintenance Instructions, the layout and location of each HVAC control panel, the layout of one of each type of unitary equipment and the locations of each, the location of each control device external to the panels, preventive maintenance, troubleshooting, diagnostics, calibration, adjustment, commissioning, tuning, and repair procedures. Typical systems and similar systems may be treated as a group, with instruction on the physical layout of one such system. The results of the performance verification test and the calibration, adjustment and commissioning report shall be presented as benchmarks of HVAC control system performance by which to measure operation and maintenance effectiveness.

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ATTACHMENT NO. 7

DRAWINGS (RFP AND SURVEY)

1. RFP DRAWINGS FOR PYSCIAL FITNESS CENTER, BUCKLEY AFB, COLORADO

These drawings (Sourceview .cals format) are included on the CD-ROM with the solicitation requirements. Copy of Sourceview Software is located under folder labeled "Installs".

2. ENGINEERING SURVEY:

"BU30p0su.dwg." survey file (AutoCAD 2000 drawing file) is included on the CD-ROM. Information from this survey file will be incorporated into the RFP drawings.

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